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WORLD RICE PRODUCTION AND TRADE

by

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FOREIGN AGRICULTURE REPORT No. 15 OCTOBER 1946

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NOTE ON CONVERSION: Production is given in bushels of rough rice (paddy), and also in short tons of milled rice for comparison. Trade and utilization are converted to terms of edible milled rice. When converting rough rice to milled, 70 percent is used for the countries of Asia, and 65 percent for all other countries. In Japan, Korea, and Formosa, production and trade are reported in brown rice, which is 80.4 percent of rough rice. Prior to 1930, milled was converted at 61.7 percent of rough rice for all the countries of the world, and in the Japanese Empire before 1931 brown rice was calculated at 78.78 percent of rough rice. Additional research is needed to determine conversion factors for use in studying rice trade and utilization in the countries of the Eastern Hemisphere.

OUTLOOK 1946-47

Production

Present prospects indicate that the 1946-47[a] world rice crop may be about 10 percent larger than the estimate of 6,300 million bushels for the 1945-46 harvest but only from 90 to 95 percent of the prewar average.[b] The anticipated increase will be due primarily to a larger production in Asia. The reduction of 5 to 10 percent from the prewar outturn is expected to result in the continuation during 1947 of a critical rice shortage in most countries. Two reasons for this are: (1) Exportable supplies from the 1946-47 harvest are expected to continue far below the prewar volume, and (2) rice stocks at the outset of the season are at an extremely low level, particularly in the heavy importing and consuming countries of the world.

The production of Asia may be 10 percent larger than the wartime low of 1945-46. Given normal weather conditions during harvest, China's crop is expected to exceed that of last year but to be from 10 to 15 percent less than the 1935-39 average production. Since India's planted acreage is at a high wartime level, the harvest in that country may not only exceed last season's below-average outturn but also surpass the prewar outturn. Japan's crop is reported as one of the best in years, but Korea's was adversely affected by June floods. The Philippine rice acreage is reported to be little, if any, above that of last year, which was only 80 percent of the prewar average.

Despite a larger acreage planted this season in the world's major prewar surplus-rice region - Siam, Burma, and French Indochina - its harvests will be far short of the prewar volume. Last year the acreage of these countries averaged about 50 percent of prewar rice area. In 1946-47 their acreage is estimated to be from 55 to 80 percent of average, partially because drought prevented the farmers from sowing intended acreages. Yields also will likely be lower than those obtained under prewar conditions. (See fig. 1.)

The outlook for Europe's 1946 rice crop indicates production will be larger than in 1945 but substantially below that of prewar years. In Africa, Egypt's 1946 production may be smaller than the 1945 outturn.

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a. The August-July crop year includes crops harvested in Northern Hemisphere countries during August-December, those harvested in Southern Asia principally during November-May, and those harvested in Southern Hemisphere countries, mostly during January-July.

b. Prewar average in this report refers to 1935-36 to 1939-40, except as noted.

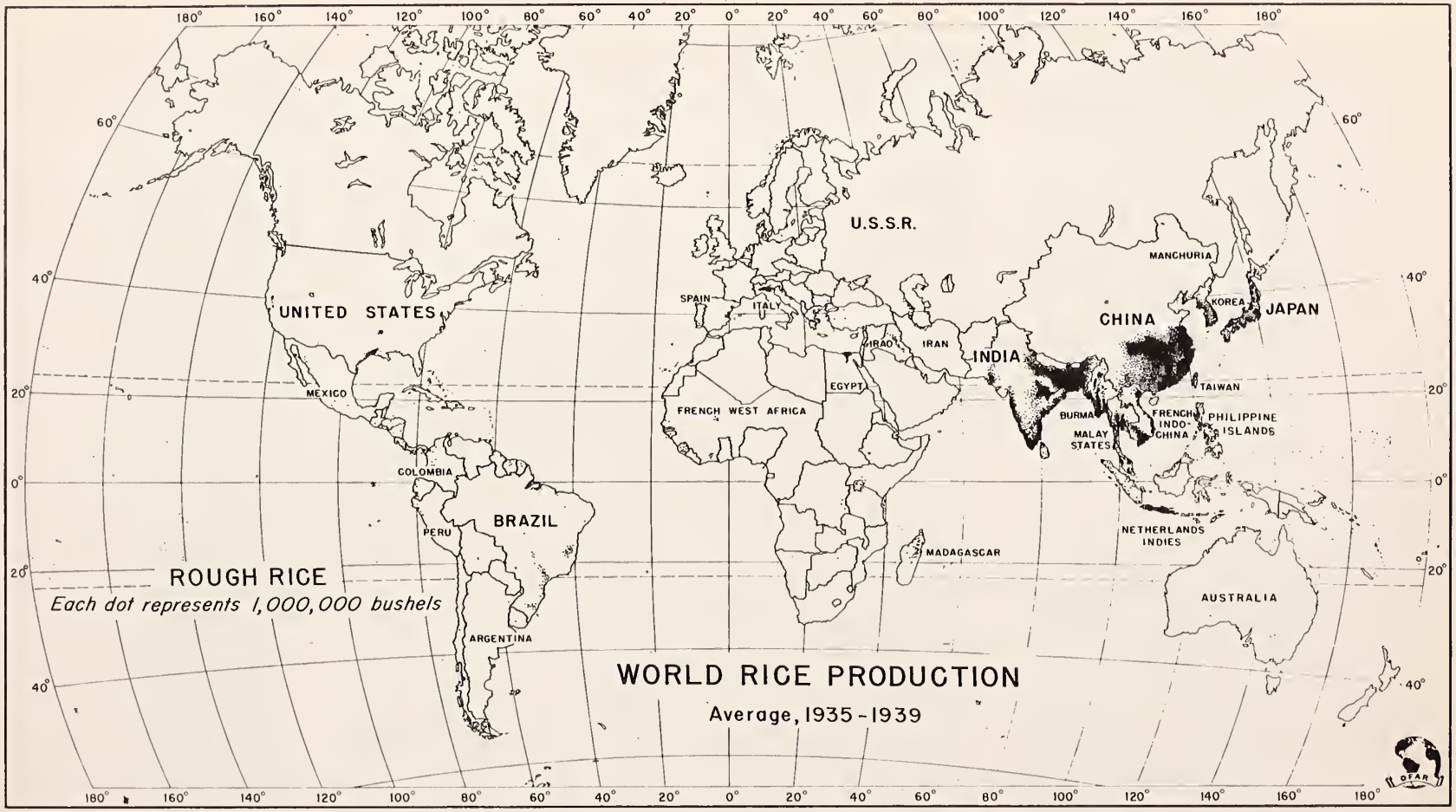

Figure 1. - Prior to World War II, Asiatic countries planted about 197 million acres of the world rice acreage estimated at 206 million acres; in 1945-46 the comparable figures were 184.5 and 196.8 million acres, respectively. Thus, the combined acreage of all producing areas other than those of Asia increased by almost 37 percent under the stress of strong world demand and short Far Eastern supplies.

Table 1. - ROUGH RICE: Acreage, yield per acre, and production in specified countries, averages 1930-31 to 1939-40, annual 1942-43 to 1945-46 a/

Continent and country	Acreage: Average 1930-31 to 1934-35	Acreage: Average 1935-36 to 1939-40	Acreage: 1942-43	Acreage: 1943-44	Acreage: 1944-45 b/	Acreage: 1945-46 b/	Yield per acre: Average 1930-31 to 1934-35	Yield per acre: Average 1935-36 to 1939-40	Yield per acre: 1945-46 b/	Production: Average 1930-31 to 1934-35	Production: Average 1935-36 to 1939-40	Production: 1942-43	Production: 1943-44	Production: 1944-45 b/	Production: 1945-46 b/
	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	1,000 acres	Bushels	Bushels	Bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels
Asia:															
French Indochina	13,505	d/ 14,020	-	-	-	-	20.8	d/ 22.5	-	281,497	d/ 316,038	-	-	-	c/ 220,000
Siam	7,141	7,088	c/ 6,000	c/ 6,000	c/ 5,000	4,890	32.4	30.1	c/ 24.5	231,402	213,079	-	-	-	c/ 120,000
Burma	12,770	12,671	c/ 10,000	c/ 8,000	c/ 8,500	6,790	28.1	27.5	19.8	358,219	348,534	-	-	c/ 230,000	134,455
China c/	d/ 47,099	d/ 48,161	-	-	-	-	d/ 49.8	d/ 52.5	-	d/ 2,345,574	2,623,383	-	-	-	2,160,000
Free China	-	e/ 38,015	35,565	34,788	35,014	34,213	-	e/ 50.8	49.1	-	e/ 1,932,996	1,646,515	1,574,478	1,736,779	1,513,448
Manchuria	472	782	-	-	-	-	31.6	40.6	-	14,923	31,783	28,463	33,950	38,016	c/ 35,000
Japan	7,887	7,862	7,754	7,622	-	7,092	70.6	75.8	59.8	557,217	595,845	609,307	574,151	535,236	424,041
Korea	4,112	3,838	2,974	3,718	-	-	48.0	51.0	-	197,500	195,763	143,387	171,094	146,716	c/ 180,000
Formosa	1,609	1,616	1,524	1,508	1,485	-	46.8	53.0	-	75,340	85,704	74,933	72,030	68,339	39,490
Philippine Islands	4,643	4,918	-	-	-	4,087	22.4	22.2	18.9	103,939	109,385	-	-	-	77,086
British Malaya	740	748	-	-	-	-	34.2	36.3	-	25,333	27,138	-	-	-	19,115
Netherlands Indies f/	9,140	d/ 9,716	-	-	-	-	30.3	d/ 31.6	-	276,935	d/ 306,930	-	286,400	-	-
India g/	70,288	72,707	75,193	81,117	83,933	79,885	28.4	26.2	24.6	1,995,645	1,904,819	1,860,752	2,291,858	2,106,426	1,961,877
Iran	d/ 560	d/ 534	642	-	-	-	d/ 40.0	d/ 34.8	-	d/ 22,413	18,577	15,677	-	18,842	20,727
Iraq	d/ 316	d/ 386	-	-	-	370	d/ 24.5	d/ 27.3	33.0	d/ 7,750	11,176	14,697	13,717	13,700	12,200
Turkey	66	78	113	-	-	-	33.6	39.1	-	2,220	3,050	2,916	2,638	4,296	3,721
Estimated total h/	190,310	196,840	189,500	191,500	193,100	184,500	-	-	-	6,805,700	7,129,800	6,327,000	6,804,000	6,475,000	5,911,000
Europe:															
Italy	360	362	398	376	310	238	94.8	103.9	c/ 84.0	34,139	37,620	37,820	34,210	24,272	c/ 20,000
Spain	117	-	116	119	118	119	124.4	-	c/ 58.0	14,558	-	10,139	10,199	c/ 12,300	c/ 10,300
Portugal	39	50	65	64	61	45	44.6	68.0	43.6	1,740	3,398	3,846	3,627	3,116	1,960
Bulgaria	18	19	38	30	19	18	43.9	54.8	35.4	791	1,041	2,296	1,389	881	637
Estimated total	540	550	630	610	530	440	-	-	-	51,400	53,100	54,600	50,700	41,800	34,100
Africa:															
Egypt	352	463	699	667	643	665	59.3	71.6	63.8	20,876	33,155	46,044	33,570	39,908	42,454
French West Africa	1,065	d/ 1,562	-	-	-	-	17.0	d/ 13.4	-	18,087	d/ 20,936	-	-	-	-
Sierra Leone	307	-	-	-	-	-	29.4	-	-	9,015	-	-	-	-	-
Madagascar	1,354	1,195	1,221	1,174	1,334	1,433	25.2	28.3	26.3	34,166	33,823	32,823	32,088	31,354	37,722
Estimated total	3,410	4,100	4,450	4,500	4,600	4,700	-	-	-	88,000	103,700	125,000	111,000	117,000	125,000
Oceania:															
Australia	21	23	34	41	25	28	77.6	92.0	91.2	1,629	2,117	2,879	3,747	1,560	2,554
Estimated total	30	40	60	80	60	60	-	-	-	2,200	2,700	5,400	6,200	3,700	4,700
South America:															
Brazil	2,074	2,329	-	-	-	-	28.4	28.5	-	58,970	66,449	92,205	103,322	c/ 102,880	c/ 115,130
Argentina	25	52	84	128	128	122	42.2	59.8	63.4	1,054	3,112	4,852	8,559	6,807	7,736
Chile	-	d/ 26	71	88	110	119	-	d/ 81.1	48.6	18	1,299	5,701	7,340	7,862	5,778
Colombia	d/ 114	-	-	-	-	-	d/ 22.0	-	-	d/ 2,508	3,378	5,830	5,901	5,923	6,030
Peru	126	107	126	145	-	-	36.1	42.8	-	4,551	4,578	5,706	6,761	6,406	7,500
Ecuador	-	-	-	-	-	-	-	-	-	2,212	3,439	7,607	6,075	4,850	7,630
Uruguay	3	13	14	13	16	-	-	66.6	-	d/ 284	866	759	849	1,030	1,423
British Guiana	78	70	96	86	93	-	44.2	50.8	-	3,445	3,559	4,068	4,362	4,812	-
Surinam	d/ 29	37	31	29	31	35	d/ 37.7	46.0	49.3	1,078	1,703	1,879	1,577	1,685	1,724
Estimated total	2,580	2,990	4,500	4,650	4,700	4,900	-	-	-	75,000	89,400	130,200	146,700	144,500	160,400
North America:															
United States	883	1,004	1,450	1,468	1,471	1,506	47.1	49.7	46.6	41,572	49,852	64,549	64,843	68,161	70,160
Mexico	84	95	161	162	170	167	41.4	42.2	c/ 36.7	3,478	4,007	5,300	5,609	5,801	c/ 6,125
Cuba c/	36	45	66	84	80	-	26.0	21.6	-	935	965	1,400	2,222	1,778	2,051
Dominican Republic	-	-	96	82	116	111	-	-	c/ 29.6	1,517	2,905	3,139	3,185	c/ 3,020	c/ 3,290
El Salvador	22	25	55	46	58	-	d/ 14.3	25.6	-	d/ 314	639	1,200	1,197	934	-
Estimated total	1,280	1,490	2,100	2,110	2,170	2,210	-	-	-	51,000	62,900	82,900	84,100	85,600	89,300
Estimated world total	198,200	206,000	201,200	203,500	205,000	196,800	-	-	-	7,073,000	7,442,000	6,725,000	7,203,000	6,868,000	6,325,000

e. The August-July crop year includes crops harvested in Northern Hemisphere countries during August-December, those harvested in southern Asia principally during November-May, and those harvested in Southern Hemisphere countries mostly during January-May. b. Preliminary. c. Unofficial. d. Less than 5-year average. e. Years 1931-37. f. Java and Madura only. Other production included in estimated total for Asia. g. Includes acreage and production in areas regularly reported only, comprising about 92 percent of the total rice area of India. h. Includes estimates for the Soviet Union.

Compiled from official sources. Office of Foreign Agricultural Relations.

It is too early to forecast the rice acreage of the Western Hemisphere for the 1946-47 season. That in the United States is slightly larger than last year's. With unfavorable weather early in the season, however, estimates of the crop are placed below last year's record. The acreage of some of the principal rice areas of South America may be as large or larger this year than last, depending on comparable prices of other crops at the time of planting.

Trade

The quantity of rice available for world trade during 1947 is expected to continue at the extremely low level of 1946, when exportable supplies were estimated at only 25 percent of prewar average exports. While the average 1935-39 international trade amounted to 8.6 million tons, exports during 1946 are estimated at about 2.2 million tons. The total export supplies in 1947 from the small crops and reduced stocks in Asia's surplus countries, together with surpluses from other parts of the world, are not likely to exceed that amount. The expectation now is that 2 or 3 years may elapse before Asia's surplus countries can again attain exports of prewar volume. On the other hand, although an import demand now exists that is far greater than the quantity available, some countries may not be able to make financial arrangements to import in prewar volume.

Rice shipments from Western to Eastern Hemisphere countries again in 1946 continued to reverse completely the historic direction of trade. This change, reflecting the large increase in production which has occurred in South and North America during the war, points to the possibility of readjustments which may take place as the Far East approaches normal production.

Europe and Japan may be markets for United States rice until the Far Eastern surplus becomes sufficient to provide more than bare import demands in Asia. Japan will have a deficit, and Korea and Formosa may not have surpluses for some time. Asia's importing countries will need more rice than its exporting countries will provide at least during 1947. (See fig. 2.)

SUMMARY 1945-46

The world rice crop of 1945-46 is estimated at 6,300 million bushels compared with 6,900 million the preceding year and with the average of 7,400 million bushels produced before the war. (See table 1.) The sharp decline in production was caused by unusually small crops in the countries of Asia, where normal planting and harvesting was prevented by conditions prevailing under enemy occupation and following the war. Reduced crops in the world's former surplus countries of Asia virtually eliminated supplies available for export from the 1945-46 output of that

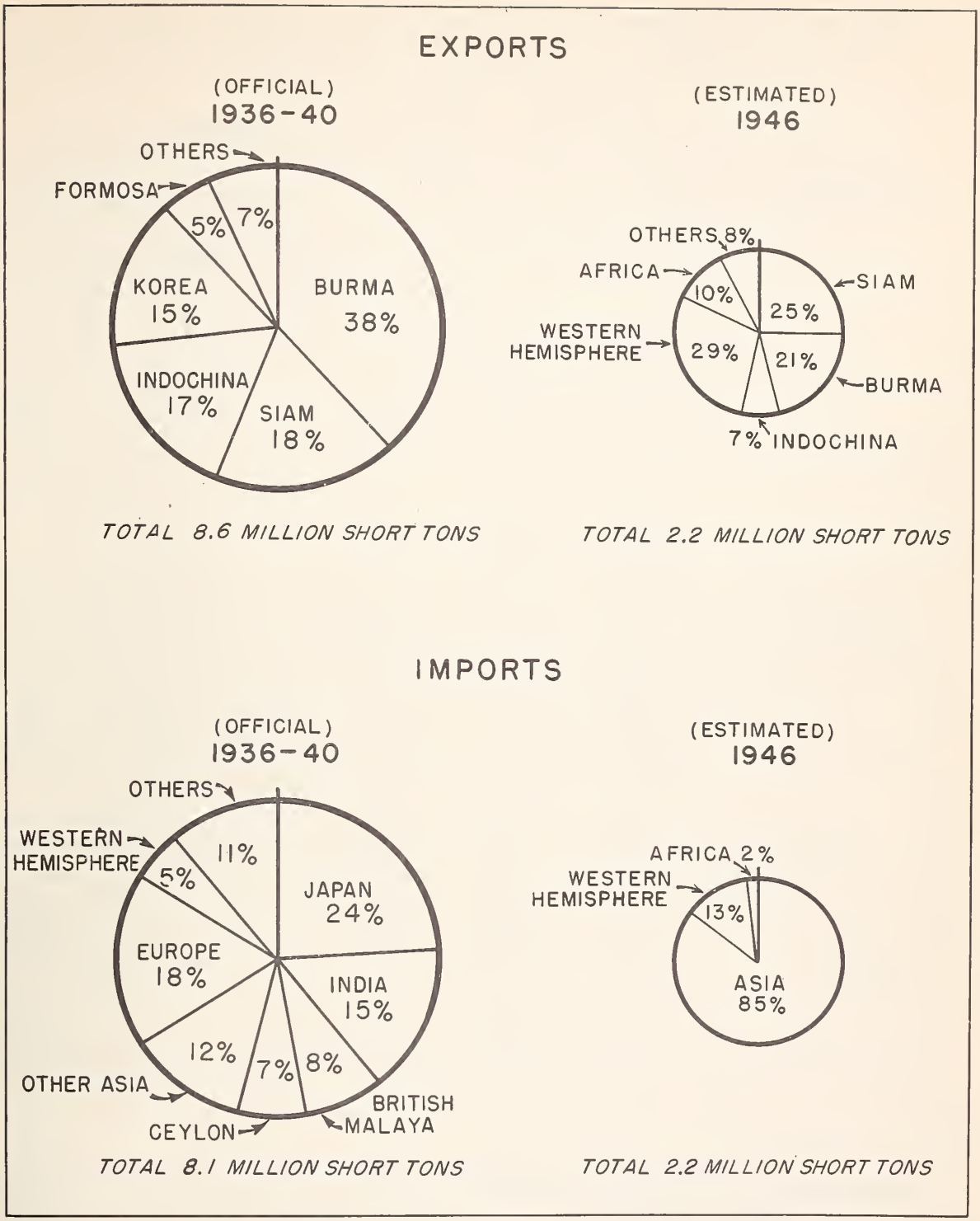

Figure 2. - RICE: World trade, average 1936-40, annual 1946.

Table 2. - RICE: World production and trade, 1935-36 to 1939-40, and estimated production, 1945-46 a/

Continent and country	Estimated production		Apparent domestic disappearance	International trade		
				Prewar average c/		Prospective 1946 b/
	1935-36 to 1939-40	1945-46 b/	Prewar average c/	Net imports	Net exports	Exports
	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons
Asia:						
French Indochina ..	d/4,978	e/3,465	3,494	-	1,484	150
Siam	3,356	e/1,890	1,840	-	1,516	540
Burma	5,489	2,118	2,237	-	3,252	470
China (22 Provinces)	41,318	e/34,000	41,729	411	-	-
Manchuria	501	e/550	586	85	-	-
Japan	9,385	6,185	11,346	1,961	-	-
Korea	3,083	e/2,825	1,790	-	1,293	0
Formosa	1,350	622	930	-	420	0
Philippine Islands	1,723	e/1,180	1,788	65	-	-
British Malaya . .	427	301	1,019	592	-	-
Netherlands Indies f/	6,960	(g)	7,171	211	-	50
India h/.	32,500	33,480	33,750	1,250	-	-
Ceylon	252	130	856	604	-	-
Others	978	(g)	1,481	580	77	140
Estimated total .	112,300	93,600	110,000	5,760	8,040	1,350
Europe:						
Italy	550	293	403	-	147	0
Spain	152	151	152	-	(g)	0
Estimated total .	777	500	2,083	1,453	147	0
Africa:						
Egypt	485	621	353	-	132	200
Estimated total .	1,517	1,828	1,721	364	160	220
North America:						
United States . . .	729	1,026	622	-	107	330
Mexico	59	90	50	-	9	0
Estimated total .	937	1,306	1,154	347	130	340
South America:						
Brazil	972	1,684	930	-	42	170
Chile	19	85	31	12	-	25
Ecuador	50	112	37	-	13	50
Estimated total .	1,307	2,347	1,330	103	80	290
Estimated world total	116,800	99,800	116,300	8,070	8,570	2,200

a. In terms of milled rice. Rough rice of Asia is converted to a milled basis at the rate of 70 percent and that of all other countries at 65 percent. b. Preliminary. c. 1936-40 average where available. Otherwise, the latest 5 years are included for which figures are available.
d. Less than 5-year average. e. Unofficial. f. Estimate for all Netherlands Indies.
g. Unavailable. h. Including estimate of production in unreported areas.

Compiled in the Office of Foreign Agricultural Relations.

continent. Stimulated by high prices, expanded production in the uninvaded countries of the world where rice could be grown contributed to relieve the extreme world scarcity of rice following the 1945-46 harvest.

In Asia, the production of China was 18 percent less than the prewar (1935-39) average, chiefly as a result of the Japanese occupation. Typhoons, floods, and fertilizer shortages caused Japan's crop to be the smallest in 40 years. In India, because of insufficient rainfall, acreage did not approach the 10-percent increase attained during the war, and production was only 3 percent larger than the prewar average. The Philippine crop was 70 percent of former output.

The crops in the prewar surplus area of Burma, Siam, and French Indochina were sufficient only for domestic requirements and those of the other former surplus countries, Korea and Formosa, also were too small to permit rice for export. The reduced harvests of Asia greatly increased its import demands, and the only supplies available from that continent were some surplus from former crops in Siam and relatively small quantities in Burma and Indochina.

The output of Europe, like that of Asia, was low, having been reduced primarily by wartime conditions. Total production was about 65 percent of the prewar volume because of reduced acreages, fertilizer and labor shortages, and unfavorable weather. Not only was there no surplus available for export, but rice consumption during 1946 in the countries of production has been substantially less than in prewar years. This cereal generally is not available for consumption in the other countries of Europe.

In Africa, a record outturn was harvested in 1945-46. The crops of Egypt and Madagascar, the principal rice-producing countries, were larger than in the preceding year and considerably above the prewar level. Adverse weather reduced the harvests in countries of British East Africa. Contrary to custom, in 1946 Africa exported more rice than it imported, in order to help alleviate the serious shortages in Asia.

In the countries of the Western Hemisphere, however, a pronounced increase occurred in production. In South America, especially, an outstanding gain was achieved by means of increased acreages in most of the countries; also, the weather was generally favorable for rice production. Through efforts of the governments and the rice industries in the countries of the Western Hemisphere, exportable surpluses from the increased output are continuing to be shipped to nations of Asia where supplies are extremely scarce. Even though this hemisphere's 1945-46 production was substantially larger than the previous record and export supplies surpass those of former years, the total quantity available for export (net) from the Western Hemisphere during 1946 is only about equal to 4 percent of the prewar international trade. (See table 2 and fig. 3.)

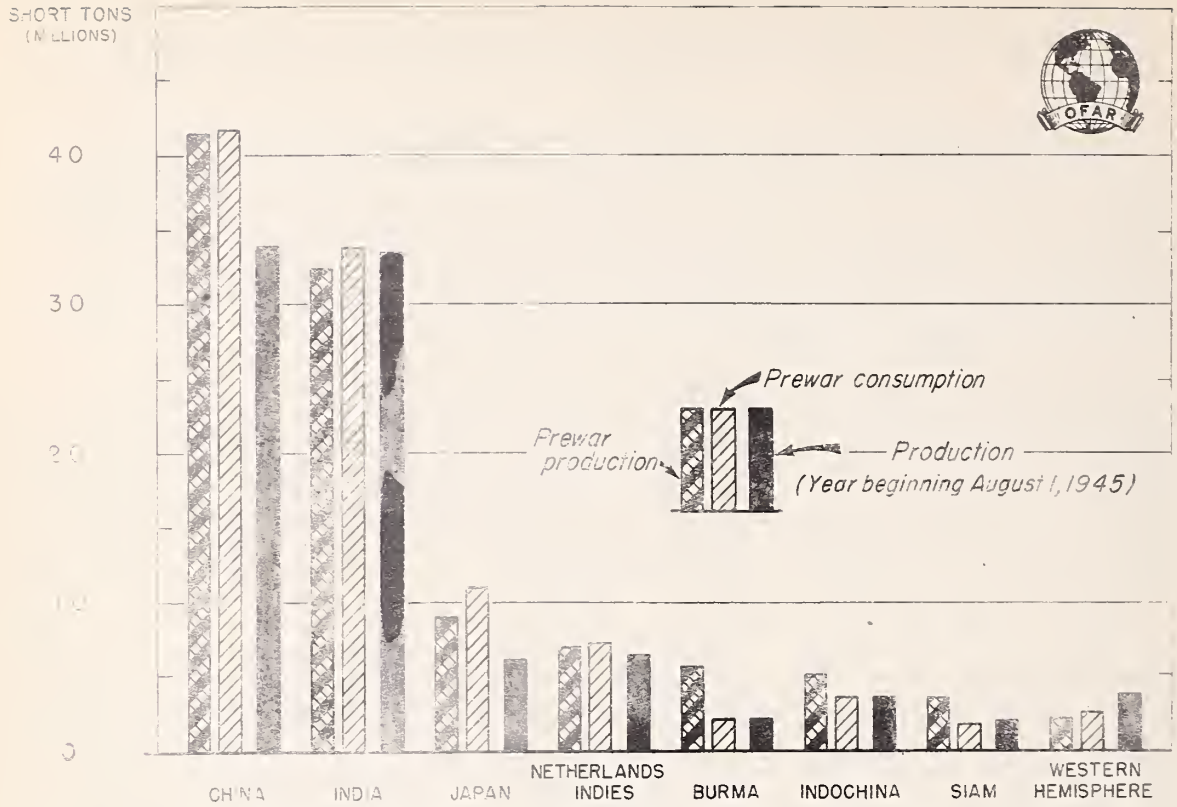

Figure 3. - RICE: Production and consumption, average 1936-40, and production, 1945-46.

EASTERN HEMISPHERE

Asia

Asia's rice production in 1946-47 may be 10 percent larger than the small 1945-46 outturn. The largest volume of increase is expected in China, but that crop will still be considerably less than the prewar average. Quite a gain over last year is expected in Japan. India's production should exceed last year's crop, as well as the prewar outturn. In the Asiatic exporting countries, complex factors will work against any great increase. Scarcity will most likely still exist in China, India, Japan, and Korea; and Ceylon, Malaya, and the Philippines will probably not be able to import their normal rice requirements.

The 1945-46 production of Asia is estimated at 5,900 million bushels (93 million short tons milled) against 6,500 million bushels (102 million tons) in 1944-45, and the average prewar crop of 7,100 million bushels (112 million tons). The drop from the prewar volume was about 17 percent and meant a loss of supplies during 1946 equal to around 19 million short tons of milled rice as compared with prewar years. The disastrous effect of this deficit is only partially alleviated by shipments from the United States, Brazil, and Egypt and by making available the surplus stocks from old crops in Siam, Burma, and French Indochina.

The only countries of the Far East where acreages planted in 1945-46 were larger than in prewar years were India and Ceylon. In the occupied countries, the areas planted to rice were considerably less than before the war. Wartime conditions prevented normal plantings in importing countries, and in the former surplus countries of Siam, Burma, and Indochina paddy farmers held their production to a self-sufficient basis only.

The weather during the 1945-46 season throughout the Far East was generally unfavorable for rice production. Lack of late rains reduced yields in India, Ceylon, Burma, and Siam. The weather was continuously bad throughout the growing season in Japan. Typhoons and cyclones also took their toll in China and Ceylon. Several other factors which contributed to low yields per acre were fertilizer shortages, loss of work animals and implements, and scarcity of labor.

There are four basic factors to be kept in mind when considering the rice situation in the countries of the Far East. The first is that a large percentage of the vast production never enters trade channels. This is particularly true in China and India. Second, rice consumers obtain from 70 to 85 percent of the caloric value of their diet from rice. Third, the exporting countries of this region have been either battlefields, enemy-occupied, or are undergoing sweeping political changes. Fourth, carry-overs of rice into the next crop year were never estimated to be more than a 3-month supply, and terminal bulk storage, as known in some other countries, does not exist.

The rice trade of the Far East as such is inactive. Exportation of this cereal is under governmental control in Burma, Siam, and Indochina. Shipments are made in accordance with allocations by the International Emergency Food Council. The internal prices which have been paid for rice, and the resultant paddy prices, are very unpopular with rice farmers in these countries, because they are low as compared with prevailing prices for other crops and for consumer goods, as well as with prices paid for rice in other countries.

Exports of milled rice and brokens from these countries from October 1945, when shipments started, through December 1946 are estimated as follows (in tons): Siam, 630,000; Burma, 570,000; and French Indochina, 150,000. The total represents only a small percentage of the exports during prewar years, when total shipments from these three countries averaged about 6.5 million tons annually. (See table 3.)

Table 3. - RICE: Exports from Siam, Burma, and French Indochina, to principal countries of destination, 1935-39

Countries of export and destination	1935	1936	1937	1938	1939	Average 1935-39 as percentage of total
	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	Percent
Siam: a/						
Asia	1,204	1,144	881	1,108	1,410	76
Europe	69	157	67	222	237	10
Africa	14	14	16	20	24	1
Caribbean . .	162	198	60	87	79	8
Others	73	44	61	100	127	5
Total . . .	1,522	1,557	1,085	1,537	1,877	100
Burma:						
Asia	2,824	2,636	2,487	2,321	3,131	80
Europe	414	331	473	377	305	12
Africa	54	64	77	48	55	2
Caribbean . .	68	56	65	46	43	1
Others	67	116	150	281	231	5
Total . . .	3,427	3,203	3,252	3,073	3,765	100
French Indochina:						
Asia	1,059	452	478	271	433	36
Europe	436	1,041	701	561	583	b/ 44
Africa	120	182	169	92	136	9
Caribbean . .	-	-	-	-	46	1
Others	60	40	135	113	430	10
Total . . .	1,675	1,715	1,483	1,037	1,628	100
Grand total . . .	6,624	6,475	5,820	5,647	7,270	-

a. Year April-March 1935-36 to 1939-40. b. To France 40 percent.

Compiled from official trade sources.

Siam

In Siam, the 1946-47 rice harvest is not expected to show any increase over the 50-percent crop of 1945-46. Rainfall was ample early in the season, but a prolonged drought in July and August resulted in a heavy loss of broadcast plantings and delayed transplanting operations. Rains in October may not greatly improve the yield, because the stand of paddy is very poor. The acreage planted is estimated at about 75 percent of an average of 7.1 million acres planted to rice before the war. Lack of rain, shortages of work animals, and scarcity of seed in a few Provinces were the principal reasons for the small acreage.

The exportable supplies of rice available in Siam during 1947 may be less than in 1946. The reduced harvest expected in 1946-47 again may not provide more than domestic requirements. A large proportion of the exportable supplies which were available on January 1, 1946, from old-crop stocks will be exported during 1946, despite the fact that this carry-over is not being shipped in so large a volume as that allocated by the International Emergency Food Council. The only surplus available from Siam during 1947, therefore, may be that portion of the wartime accumulation of stocks which was not exported in 1946.

The 1945-46 acreage in Siam was only 70 percent of the prewar average, and the yield was poor owing to failure of late rains at the time of heading. The crop that was harvested principally in December-January, therefore, is estimated at only 120 million bushels (1,890,000 short tons milled), which is about sufficient for internal needs (table 4). The decline in Siam's production was sharp during the last 2 years of occupation, but, with a drastic decline in exports, it was possible to accumulate some surplus stocks. These stocks on hand at the close of the war have been variously estimated from 880,000 to 3,900,000 short tons of rough rice, but the figure of general acceptance as of January 1946 was 1.9 million tons (1.3 million tons of milled rice).

Several factors have hindered the movement of this surplus rice to the famine areas of the Far East. The basic reasons were: (1) Destroyed and disrupted transportation facilities within Siam, (2) the original demand by Great Britain that this surplus be given as reparations under the peace treaty and the low price which was finally offered in payment for the rice, and (3) the slow rate at which Siam's governmental authority and administration have been established.

Among the countries of southeastern Asia, Siam has the best potential for a quick return to full production. Postwar Siam may not be greatly different from prewar Siam. It was a sovereign country, had a high rate of literacy, and was politically advanced. Dislocation of economic, political, and social conditions was less in Siam than in any other country occupied by Japan. Physical war damage resulted only from bombings, which were chiefly directed against the railroads and took place in the last few months of the war. The damage to railways was

severe, however, and the necessity for moving paddy to Bangkok by rail has resulted in high priority being given to their rehabilitation.

Table 4. - RICE: Production, exports, and utilization in Siam, 1945-46, with comparisons

Year of harvest	Production		Net exports b/	Apparent utilization b/
	Rough	Milled a/		
	Million bushels	1,000 short tons	1,000 short tons	1,000 short tons
Average:				
1930-31 to 1934-35 . .	231	3,638	1,648	1,990
1935-36 to 1939-40 . .	213	3,355	1,516	1,839
Annual:				
1941-42 c/	240	3,780	d/ 1,880	1,900
1945-46 c/	120	1,890	-	-

a. Rough rice converted to terms of milled at 70 percent.
b. Siamese year (April-March) following December-January harvest.
c. Unofficial estimates.
d. Exportable supplies from 1941-42 crop. Much of this surplus was not exported.

Compiled from official sources, except as noted.

The attainment of prewar production is, however, hindered by some other obstacles which must be overcome. First is the scarcity of plow animals in the paddy district of the central plains, where the reduction in numbers exceeds 50 percent. More than 60 percent of all Siam's rice is produced in this area. A heavy flood in 1942 drowned many animals, and during subsequent years of occupation the Japanese bought large numbers and slaughtered them for meat. Uncontrolled epidemics of rinderpest also took a heavy toll during every dry season. The one mitigating circumstance is that the cattle situation in the normal surplus-producing area of the northeast was not greatly disturbed during the war. A Siamese law prohibited the movement of cattle from Province to Province in an attempt to control the spreading of rinderpest and to keep the animals away from the Japanese. Consequently, there are still surplus cattle in this northeast area. Factors that now prevent the movement of these cattle, such as high prices, banditry, and lack of railroad transportation, should greatly improve before the 1947-48 planting season. The veterinary service is again active, and the loss from disease should be cut to a minimum.

A second problem is getting people back on the land. In the central plain many farmers gave up their occupation. The demand for paddy was slight and the prices low. Many men were called up for Siamese military

service. The Japanese military demands on labor for airfield, road, and general construction work was heavy and more remunerative than paddy farming. This is the first time in Siamese history that a large migration from the farm to salaried labor has taken place. Many people were decidedly reluctant to return to the farms for 1946-47 planting. Wages during the planting season remained high because of rehabilitation work and expanded maintenance work on roads, railways, canals, and irrigation works, all of which was deferred during the war. This work will probably be reduced before the 1947-48 season and there should be no alternative to returning to the land.

Government schemes for expansion of agricultural credit and cooperative societies should be functioning better by 1947-48. The moving of all surplus paddy out of the producing areas will help convince the farmers that there is a market again, although prices may not be very attractive. Increasing supplies of consumer goods should bring prices down to a level more in keeping with paddy prices. Incentives will come by another year that did not exist during the planting season this year. Plantings for the 1947-48 crop might reach as high as 80 to 90 percent of the total paddy acreage.

Burma

The goal for Burma's 1946-47 rice acreage during the planting season was set at 8,500,000 acres, which was to be planted mainly by August. To help increase the rice acreage, the Government (1) granted on April 5 a subsidy to farmers of $3.65 for every extra acre planted to rice and (2) on May 1 allocated $900,000 for loans to farmers during the season. No report as to acreage has yet been received. In view of the disrupted economic conditions which exist as a result of the war, however, this acreage figure appears optimistic.

Weather conditions were very favorable for production up to September 30, which justifies the expectation of a good crop. With the continuation of favorable weather through harvesttime, a crop of from 200 to 250 million bushels (3 to 4 million tons milled) may be produced, which is from 55 to 70 percent of the prewar production. In this event, a surplus of around 500,000 to 1 million tons of milled rice might be available for export during 1947.

The world's greatest exporter of rice was twice a battlefield from the extreme north to the far south. The whole country was in the range of Allied bombers throughout Japanese occupation. No exports were possible from the outset of the war, except limited amounts to British Malaya, and the surplus from the bumper 1942 crop eventually rotted. Conditions were chaotic and life itself uncertain. The paddy farmer continued to do the only thing he could with his land - produce more paddy. Japanese promises of export markets failed to materialize, and eventually the acreage declined.

The 1945-46 crop occupied about half the paddy land, 6.8 out of 12.8 million acres. The crop was poor owing to early cessation of the rains, and a harvest of 134 million bushels, or 2.1 million short tons milled, was reaped (table 5). This amount is barely equal to prewar home consumption. Accumulated surpluses from previous crops, however, have made exports possible. A total of 350,000 tons of cleaned rice and brokens of extremely low quality was shipped from October 1945 to August 1946. Much of this would not have been accepted as human food in years of normal world supplies.

Table 5. - RICE: Production, exports, and utilization in Burma, 1945-46, with comparisons

Year of harvest	Production		Net exports b/	Apparent utilization b/
	Rough	Milled a/		
	Million bushels	1,000 short tons	1,000 short tons	1,000 short tons
Average:				
1930-31 to 1934-35 . .	358	5,639	3,492	2,147
1935-36 to 1939-40 . .	349	5,497	3,252	2,245
Annual:				
1940-41 c/	394	6,206	d/ 3,492	2,700
1945-46	134	2,100	(e)	(2,100)

a. Rough rice converted to terms of milled at 70 percent.
b. During calendar year following December-January harvest.
c. Preliminary.
d. January-November.
e. Negligible.

Compiled from official sources.

The first question that consuming and competing surplus-producing countries ask is: When will Burma get back to full production? Estimates vary from 3 to 6 years. No one knows, for there are many and complex obstacles to overcome. Foremost is the paddy farmer's lethargy, which is due to several factors that are the direct result of the war.

Several measures that might restore the confidence of the Burman rice farmer include: (1) Removal of old-crop rice in order to create hopes for future sales, (2) provision of consumer goods, (3) establishment of rice prices in line with other commodities, (4) reestablishment of credit, (5) recovery of transportation facilities, (6) law enforcement to control widespread banditry, and (7) increase of the cattle population.

The discouragement of the rice grower may not be overcome until sufficient consumer goods, chiefly light-weight cotton textiles, are made locally available at prices that are in line with local paddy prices. The Burmese farmer has food for himself; what he needs is clothes, and he may not produce food for others until he actually sees the textiles he desires to obtain in exchange for his surplus production.

Prices of other agricultural products grown in non-rice areas advanced during the war by as much as ten times. The rice price, on the other hand, was just about twice as high. The vast majority of paddy farmers had nothing to sell and remained penniless. To make matters worse the normal sources of credit had all but vanished. About 70 percent of the credit available before the war came from Indians, many of whom are no longer living in Burma. Agents of Indian banking firms have not been able to come back, and many are reluctant to do so. Consequently, the firms are not investing money in Burma again until the future status of their agents is decided. The Government of Burma has put into force two schemes to attempt to fill the need for credit. The total amount expected to be extended for the 1946-47 crop is less than 2 million dollars as compared with the estimated need of 30 million dollars.

Burma has a long-standing tenancy problem, which became critical before the war and is still far from solution. The High Court declared a year-old tenancy law unconstitutional just before Burma fell. A new tenancy act has recently been promulgated. In the meantime, a stopgap executive order for the current crop is in effect, the main point of which is that a landlord cannot evict a tenant for nonpayment of rent. Fifty percent of all paddy land is worked by tenants. As high as 67 percent of the land in the main rice districts is owned by nonagriculturists. Fifty percent was formerly owned by Indians from whom Burma desires to regain the land. Rumors of outright confiscation, or of forced sale at extremely low prices, keep both landlord and cultivator confused.

The unplanted paddy acreage has fast been growing up in deep-rooted grasses and jungle vegetation. Prodigious amounts of hand labor will be required to get this land back into shape for cultivation. For the Burman landowner, this will not be too difficult, once incentives again exist for full production. In the case of land owned by Indians, however, there is an entirely different problem. Unless he is sure of retaining ownership for a number of years, the Indian landowner may not spend money for labor to clear the land. Nor will he indirectly invest money by letting tenants occupy the land at the low rents and long leases which the tenant would demand before attempting to put the land back into cultivation.

The problem of shortages of plow cattle and buffaloes will be greater in 1947-48, when a larger acreage than planted in the current

year will demand more work animals, the numbers of which were considerably reduced during the war. Until prices of paddy and other crops are equalized, the paddy farmer cannot compete with the dry-land farmer in the purchase of work animals. Another part of this problem is the slow rate at which the cattle population may increase, since prewar numbers showed only a slight annual gain. The question as to when Burma will be back to full rice production seems to be unanswerable at this time.

French Indochina

No estimate has been made of the current 1946-47 crop in French Indochina. The distribution of rainfall and general water levels have been unusually favorable, which indicates that good yields may be obtained. A safe assumption is that the acreage will be as large as last year's and that Cochin Province will have a surplus of half a million tons. Whether any of this will be needed to feed other sections of the country is undetermined at present. No great increase in acreage can be anticipated, because conditions were very unsettled up to planting time and the paddy farmer was discouraged. None of the usual incentives for extensive planting existed. Cattle were scarce, and the price for paddy at planting time was not attractive to the farmer.

Production data for the 1945-46 crop have not been reported. The only indication came from a photographic survey, made by air, from which the total production was estimated at 220 million bushels of rough rice, or 3.5 million short tons milled (table 6). This crop, only 70 percent of the prewar production, was about sufficient for domestic requirements. Through accumulated carry-overs, however, some rice was available for export. The great surplus rice area of Cochinchina was estimated to have produced 1.7 million tons of rough rice, which would have meant a surplus of about 385 million short tons of milled rice in that Province.

Several factors, however, checked the accumulation of a substantial surplus for export. The fighting between Government forces and Nationalists, which started in September 1945, caused some of the crop to remain unharvested in the fields. Some carry-over of stored paddy and rice was destroyed by burning. Wherever possible the Nationalists denied the Government access to paddy. When the Government did obtain stores of paddy, the Nationalists blocked, as effectively as they had means, the subsequent movement of those stores to the mills and ports. Armed escort was necessary to effect such movement as did take place over the disrupted rail, road, and river facilities. The feeding of occupational troops, particularly Chinese; the surrendered Japanese; and civilians in famine-stricken Tonkin used all the rice that became available in the first half of 1946. Conditions in the north are now less critical, because the summer crop of Tonkin was harvested in May and June, after the Chinese occupation troops left and the Japanese were repatriated. The French authorities have indicated to the International Emergency Food Council that there is a surplus of 120,000 tons of rice for allocation in the second half of 1946.

Table 6. - RICE: Production, exports, and utilization in French Indochina, 1945-46, with comparisons

Year of harvest	Production		Net exports b/	Apparent utilization b/
	Rough	Milled a/		
	Million bushels	1,000 short tons	1,000 short tons	1,000 short tons
Average:				
1930-31 to 1934-35 . .	281	4,426	1,343	3,083
Annual:				
1935-36	296	4,662	1,715	2,947
1936-37	309	4,867	1,483	3,384
1937-38	309	4,867	1,037	3,830
1938-39	349	5,497	1,628	3,869
1945-46 c/	220	3,500	(d)	3,500

a. Rough rice converted to terms of milled at 70 percent.
b. During calendar year following November-May harvest.
c. Estimated.
d. Negligible.

Compiled from official sources.

The prewar pattern of export, with the greater part of the exports going to France and the French colonies, was not possible in 1946 because of large allocations to China by the I. E. F. C. What the pattern of export trade will be after allocations are no longer necessary is not clear at present. There will be a strong tendency for the bulk of export to follow prewar lines if amicable relations arise out of the new colonial relationships which are being negotiated between the French and the Nationalist groups.

Korea

The 1946 rice crop in the American zone of Korea is forecast at about 100 million bushels (1.8 million tons of brown rice), or only 65 percent of the 1945 harvest in that area. The prewar average outturn for all Korea amounted to 195 million bushels, or 3.5 million tons of brown rice. Before the war, production in the rice area under American control equaled from 70 to 75 percent of Korea's total rice crop. The principal reasons for the expected drop in the 1946 production are the almost complete lack of commercial fertilizers during planting and widespread June floods, which washed out much of the newly planted rice fields.

Since the beginning of 1946, rice supplies in Korea have been in short supply. Except for the adverse effect of fertilizer shortages, conditions were favorable for an excellent crop in 1945, with the result

that the harvest was only 8 percent less than the prewar average. This production, however, was largely utilized by the end of 1945. Korea formerly was denied a full rice diet in order that exports amounting to about one-third of the production could be made to Japan. Substantial imports of coarse grains, such as millet, kaoliang, and corn, were obtained from Manchuria for use as food. When the 1945 crop was harvested, in the absence of imported foods and with the cessation of exports to Japan, Korea's rice consumption rose sharply.

The estimated production of 1.8 million tons for 1946 in the American zone means that domestic rice supplies will be substantially less than consumption demands during 1947. Of 3.5 million tons, the prewar average production for all Korea, about 1.3 million were exported to Japan. The balance, 2.2 million tons, was utilized in Korea. While the prewar population of all Korea was around 23 million, the estimated population of the American zone, including repatriated Koreans from Japan and north of latitude 38°, is between 18 and 19 million. Furthermore southern Korea has always been the heavy rice-consuming area.

China

The 1946 rice production of China is estimated at 85 to 90 percent of the prewar average (1935-39) outturn. This crop of 2,200 to 2,400 million bushels (35-38 million tons milled) compares with the estimate of 2,160 million bushels (34 million tons) in 1945 and the average of 2,623 million bushels (41 million tons) from 1935 to 1939. The second official estimate for the 1946 crops in the 15 wartime free Provinces of China shows an 12-percent increase over the reduced output of the preceding season. Production in these Provinces usually equals around 75 percent of China's total harvest. While the largest gains are in Hunan, Kiangsi, and Chekiang Provinces, crops are larger than last year in all except Szechuan and Honan Provinces.

In 1945-46, even though the percentage decrease in China's rice outturn was less than in most of the other invaded countries of the Far East, the immensity of its normal production caused its deficit to be the largest in Asia. China harvests about 35 percent of the world's rice production from 20 to 25 percent of the world's total acreage. The 1945 outturn was 18 percent less than in prewar years, which was a reduction of 465 million bushels, or more than 7 million tons less than average. The decline was due to the Japanese invasion and unfavorable weather. Because of enemy occupation, loss of property, including work animals and farm implements, prevented the planting of full acreages and the harvesting of normal yields.

China's domestic utilization before the war approximated 40 million short tons. Imports were only 400,000 tons in the late 1930's, when a series of bumper crops was harvested. During 1946, not only are supplies from production short by more than 7 million tons, but rice imports

are extremely difficult to obtain. Some imports are being shipped in by UNRRA from the United States, and some from Siam and French Indochina. The scarcity of rice is complicated by poor distribution, chiefly resulting from inadequate means of transportation. Inflation, hoarding, and concentration of troops in deficit areas also add to the problem of obtaining rice. Because of the shortage, prices paid for this commodity are fantastic.

The cities along the coast of China formerly consumed most of the country's rice imports, although much of their large requirements came from domestic production. Imports originated primarily in French Indochina and Siam and went to Kwangtung Province, particularly Canton, as well as to such cities as Shanghai, Tsingtao, and Tientsin. The heavy utilization areas are in central and southern China, where rice is the principal crop. In these areas the normal rice consumption of the Chinese ranges from 300 to 400 pounds per capita.

Manchuria

The 1946 rice crop of Manchuria is reported to be from one-third to one-half of the prewar average. This would mean a harvest of from 10 to 15 million bushels (150,000 to 250,000 tons milled), compared with an average of 31.8 million bushels (500,000 tons) before the war. The large reduction is attributed chiefly to the repatriation of Japanese and Korean nationals.

Through the extension of irrigation projects, the Manchurian rice acreage was increased during the war. As a result, the record outturn of 38 million bushels (600,000 tons) in 1944 was almost 20 percent larger than the prewar average. The size of the Manchurian crop is extremely variable, depending to a great extent on the availability of water for irrigation. No surplus was available for export from the 1945 crop, estimated at 35 million bushels (550,000 tons).

The greatest expansion in Manchurian rice output occurred during the 1930's through Japanese efforts following their 1931 invasion. Most of the Manchurian farmers, who originally came from north China, were not accustomed to growing rice; but, beginning about 1934, large numbers of Korean and some Japanese farmers were brought to Manchuria, many of whom took up rice farming. The increased Japanese population in Manchuria also created a greater demand for rice. Prior to World War II about 85,000 short tons were imported in order to meet requirements.

Formosa

The 1946-47 production of Formosa is forecast at 54 million bushels (1 million tons of brown rice), a crop that is larger than last year's but still only 65 percent of the prewar average. This below-average production probably will not provide a surplus for export during 1947. The

reduction is mainly attributed to the scarcity of fertilizers. The extent to which Formosa's future crops can return to the prewar level depends largely upon the quantity of fertilizers that can be imported. Prewar yields, ranking second largest in Asia, after Japan, were maintained through heavy application of fertilizer and the planting of improved varieties.

The 1945-46 rice outturn was about 45 percent of prewar production. The principal cause of the reduction was the lack of fertilizers, but storm destruction also contributed to the decrease. The small crop was barely sufficient for domestic needs. Before the war, Formosa produced, on an average, 86 million bushels of rice; the first crop amounted to 42,000,000 bushels; the second, to 44,000,000 bushels. About one-half the total crop, or 700,000 short tons of brown rice, was exported to Japan.

Japan

Preliminary estimates of Japan's rice crop in 1946 are between 500 and 550 million bushels (9-10 million tons of brown), compared with 425 million bushels (7.7 million tons) in 1945, and 595 million bushels (10.8 million tons) before the war. Weather conditions up to October were unusually favorable for rice production, and despite a shortage of fertilizers, good yields were expected. The increase in output will not be great enough, however, to make Japan independent of imported food in 1947 if a reasonably satisfactory diet is maintained. (See table 1.)

The 1945 rice harvest of Japan was reported at only 70 percent of prewar, or the smallest in 40 years. Yields were reduced not only by fertilizer shortages, but also by continuously adverse weather, which included periods of cold, typhoons, and floods. Collections of this crop from farmers were not so large as anticipated; thus, supplies for city consumption were further reduced.

The volume of rice formerly utilized in Japan amounted to more than 12 million short tons (brown) annually, of which more than 10 million were supplied by the domestic crop, and the remainder by imports (table 7), virtually all from Korea and Formosa. The drop in the 1945 harvest meant that rice supplies from domestic production were reduced to 3 million tons less than the 1935-39 average outturn. This deficit was greatly enhanced by the loss of Korean and Formosan imports, which formerly amounted to about 2 million tons annually.

The future rate of increase in production probably will depend largely on the extent to which commercial fertilizers can be provided. Rice yields in Japan before the war, by reason of heavy application of fertilizers and the use of improved varieties, were the highest in Asia, averaging about 75 bushels per acre. During the war, however, fertilizer

shortages caused a decline in the yield per acre. The amount of additional land that can be utilized for rice cultivation is reported to be rather small. Therefore, if the Japanese are to have a rice diet equal to that of prewar years, imports will continue to be necessary.

Table 7. - RICE (brown): a/ Apparent utilization in Japan, averages 1930-34 and 1935-39, annual 1940-43 b/

Item	Average 1930-34	Average 1935-39	1940	1941	1942	1943	1946
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
Stocks	1,312	1,666	722	721	1,169	389	-
Production (1929-45) c/	10,297	10,213	11,403	10,066	9,109	11,041	7,700
Imports:							
Foreign d/	139	36	1,320	1,625	1,446	924	-
Korea	1,214	1,322	65	546	865	e/ 430	-
Formosa	582	765	461	326	282	271	-
Total imports	1,935	2,123	1,846	2,497	2,593	e/1,625	(f)
Exports	158	110	156	166	116	104	-
Total supply	13,386	13,892	13,815	13,118	12,755	12,951	7,700
Carry-over	1,623	1,257	721	1,169	389	e/ 600	-
Apparent utilization	11,763	12,635	13,094	11,949	12,366	e/12,300	-
	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds	Pounds
Utilization per capita	357	357	360	324	332	e/ 326	-

a. Brown rice is equivalent to 80.4 percent of rough rice.
b. November-October year.
c. Of year preceding utilization.
d. Foreign imports consist largely of milled, containing varying percentages of broken rice.
e. Unofficial estimate.
f. Negligible.

Compiled from official statistics.

India

The main crop of India is planted in August, but no estimates of the 1946-47 acreage have been received. Short food supplies, high prices, and lack of imports from Burma at the beginning of the season provided incentives to full production. The expectation is, therefore, that the planted area will be as large as last year's 80 million acres.

The weather up to the end of September was favorable for production. This crop will be harvested principally in December and January.

Unfavorable weather reduced the rice production of India in the crop year 1945-46. Although the outturn was less than that of the preceding 2 years, it was slightly larger than the annual prewar disappearance (table 8). Because of small crops of other food grains, increased purchasing power, and a gain in population, the current rice crop was reported to be substantially below domestic requirements. Strict rationing and governmental procurement of all grains and pulses, supplemented by large imports of wheat, avoided famine up to October 1946.

Table 8. - RICE: Production, a/ trade, and utilization in India, average 1937-38 to 1941-42, annual 1942-43 to 1945-46 b/

Year April-March	Production		Imports	Exports	Apparent domestic utilization
	Rough	Milled			
	Million bushels	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons
Average:					
1937-38 to 1941-42	1,853	29,185	1,618	329	30,474
Annual:					
1942-43	1,861	29,311	73	311	29,073
1943-44	2,292	36,099	(c) (d)	c/ 31	36,068
1944-45	2,106	33,170	(c)	c/ 11	33,181
1945-46	1,962	30,900	-	-	-

a. Includes production for areas regularly reported only, comprising about 92 percent of the total rice area of India.
b. Includes milled rice and rough rice in terms of milled converted at 70 percent.
c. Excluding land trade, which is not yet available. Land net imports averaged about 50,000 tons before the war.
d. Less than 500 tons.

Compiled from official sources.

India, before the war, was the world's largest importer of rice, excluding Japan's shipments from its colonies, as well as the second largest producer of rice. This unusual situation is in part due to density of population and the very low yields on small farms. India's rice yields are among the lowest in Asia. In 1945-46, rice production equaled about 30 percent of the world crop, compared with approximately 40 percent of the world acreage.

The unexpected and abrupt loss of imports from Burma in 1942 denied India over 1 million tons of rice yearly throughout the war. This was one of the basic factors in the 1943 Bengal famine. Because of this loss, a larger production became necessary in order to provide sufficient food. A gain of 10 percent in the acreage, therefore, was achieved during the war by bringing new land under cultivation and reducing the acreage of fiber crops, principally jute.

Bengal, Madras, and Bihar Provinces have 55 percent of India's rice acreage. In Bengal, the main winter crop is harvested during November-January and accounts for 75 percent of its production. The summer crop is grown on the lower levels of the same land, and, since water supplies are limited, the crop equals only about 23 percent of total production. The production of the other two Provinces and of Assam and Orissa follow the same pattern. In normal times, only the main-crop paddy enters trade channels. The other crops are consumed by the producer and local villagers.

Ceylon

Of the two crops in Ceylon, the one planted in March and April 1946 and harvested from July to September may have been less than average, because of drought conditions. Since rainfall returned to normal before the planting (August-October) of the second crop, however, this acreage may produce a large crop for harvest next March. A drought of exceptionally long duration prevented a gain in Ceylon's rice production during the 1945-46 year, although plans to extend the acreage were carried out. In the next few years, with the acquisition of machinery that is greatly needed in order to provide additional irrigation, plans have been made to plant sufficient acreage to produce all the rice needed by Ceylon.

Through custom, rice is the preferred food of the Ceylonese, and their demands for this cereal will be as great as in former years, if not greater, as soon as it can again be obtained. Before the war, only about 30 percent of the total requirement was produced on the island (table 9), and imports were the third largest in the world, ranking next after India and Japan. Consumption then averaged around 250 pounds per capita, but, after imports were cut off, it was reduced by more than one-half. The extent to which the program for improved irrigation is carried out in the future will determine whether production will supply the requirements of this island, or whether imports of rice will again attain substantial volume.

Before the war, about 60 percent of the 600,000 tons imported came from Burma, and the rest, principally from India, Siam, and French Indochina. Since 1942, the largest share of the imports has come from Egypt and Brazil and has supplied Ceylon with about one-third the amount of its prewar imports.

Table 9. - RICE: Production, imports, and utilization in Ceylon, average 1937-41, annual 1942-45

Year	Production		Imports	Apparent utilization
	Rough	Milled		
	1,000 bushels	1,000 short tons	1,000 short tons	1,000 short tons
Average:				
1937-41	16,000	250	614	865
Annual:				
1942	15,000	235	264	500
1943	14,600	230	155	385
1944	12,900	200	126	325
1945	8,000	130	200	330

Compiled from unofficial estimates and Ceylon customs returns.

Philippine Islands

The 1946-47 rice crop of the Philippine Islands is forecast at 85 million bushels (1.3 million tons milled) from about 4,300,000 acres. Although this crop is larger than the 77 million bushels (1.2 million tons) harvested the previous year, it still is less than 80 percent of the prewar average. The acreage is estimated to be only slightly larger than that of 1945-46 because of labor unrest and shortages of carabaos, plows, and seed.

The area planted to rice in 1945-46 in the Philippine Islands was about 80 percent, and production was about 70 percent, of the prewar average. While the most important factor in the decrease of acreage was lack of rainfall during the planting season, labor shortages and loss of work animals and implements as a result of the war were responsible for the decline in both acreage and outturn. The rate of decrease in production in the various Provinces was not uniform. The decline in some States was as low as 60 percent, but larger crops were harvested in three Provinces than before the war. The increase in the outturn of these Provinces occurred where rice replaced sugarcane as a crop during the occupation.

The prewar rice utilization of the Philippine Islands averaged around 1.8 million short tons, 95 percent of which was produced domestically (table 10). The quantity imported varied during the 5 years ended with 1940 from 10,000 to 100,000 tons, according to the size of the domestic crop, but the average was 65,000 tons. Rice was imported chiefly from Siam and French Indochina, usually of the cheaper short-grain varieties.

Table 10. - RICE: Production, trade, and utilization in the Philippine Islands, 1945-46, with comparisons

Year	Acreage	Yield per acre	Production		Net imports a/ b/	Apparent utilization a/ b/
			Rough	Milled a/		
	1,000 acres	Bushels	Million bushels	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons
Average:						
1930-31 to 1934-35	4,643	22.4	104	1,638	10	1,648
1935-36 to 1939-40	4,918	22.2	109	1,717	65	1,782
Annual:						
1940-41	5,141	22.4	115	1,811	(c)	(c)
1941-42	5,729	20.6	118	1,858	(c)	(c)
1945-46	4,087	18.8	77	1,213	(c)	(c)

a. In terms of milled rice converted at 70 percent of rough rice.
b. Calendar year following harvest.
c. Not available.

Compiled from official sources.

In 1946 an acute rice shortage developed, because production dropped to 500,000 tons less than in prewar years and imports were difficult to obtain. Like other areas in great need of rice, the Philippines are receiving their pro rata share of available supplies, but this share is below their needs. The use of root crops as a substitute is, however, alleviating this shortage to quite an extent. United States rice exports to the Philippines from January to July 1945 amounted to 93,000 tons, or 26 percent of total United States exports during that period.

British Malaya

The November-April 1945-46 rice harvest of British Malaya was approximately 70 percent of the prewar average. Deterioration of growing conditions in rice-producing areas under occupation was the principal reason for the drop in outturn. During the 10 years ended with 1940, because of an extended acreage and a gain in yield of from 25 to 35 bushels per acre through the use of new methods and varieties, production increased substantially above the previous output. Under Japanese domination, with the discontinuance of improved methods, rice production probably tended to revert to its former level.

Rice has always been of vital importance to the people of British Malaya. Ninety-nine percent of the population before the war ate rice as their staple food. During the period of increased production from 1936 to 1940, consumption is estimated to have expanded from 395 to 420 pounds per capita. Rice utilization equaled about 1 million tons, approximately two-thirds of which had to be imported. (See table 11.)

Table 11. - RICE: a/ Imports into British Malaya, 1934-38

Country of origin	1934	1935	1936	1937	1938	1934-38 (percentage of total)
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	Percent
British India	7	8	9	11	14	1
Burma	197	237	224	309	282	32
French Indochina	19	44	32	35	24	4
Siam	471	446	537	441	593	63
Other countries	(b)	(b)	(b)	1	(b)	-
Total	694	735	802	797	913	100

a. Includes cargo, parboiled, white, and broken rice.
b. Less than 500 tons.

The Foreign Trade of Malaya for the Year 1938.

The 1945-46 output was 125,000 tons smaller than that of prewar years, increasing import demands by that amount. A share of Siam's exportable surplus this year is being received in British Malaya, and some rice is being obtained from Burma, but the imports represent only a small percentage of requirements. Preparations are being made to increase the acreage of all food crops in order to alleviate the scarcity of food caused by the decline in both rice production and imports.

Table 12. - RICE: a/ Exports from British Malaya, 1934-38

Country of destination	1934	1935	1936	1937	1938	1934-38 (percentage of total)
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	Percent
British North Borneo	11	7	5	4	5	3
Brunei	3	3	3	3	3	2
Sarawak	27	36	40	36	34	18
Ceylon	10	4	2	4	1	2
Zanzibar	4	6	5	3	4	2
Netherlands Indies	128	149	146	103	178	72
Other countries	3	2	3	2	2	1
Total	186	207	204	155	227	100

a. Includes cargo, parboiled, white, and broken rice.

The Foreign Trade of Malaya for the Year 1938.

Milled-rice imports in 1940 were classified generally as follows: Cleaned, 70 percent; broken, 15 percent; parboiled, 10 percent; and cargo, 5 percent. In addition, about 5,000 to 10,000 tons of paddy and around 300,000 tons of bran, flour, and meal were imported, little of which was reexported. About one-fourth of the rice imported into British Malaya in normal times was reexported, primarily to countries of south Asia (table 12). Usually almost three-fourths of the reexports were of white rice, and the remainder consisted almost entirely of brokens.

Netherlands Indies

Reports of the 1946 (April-June) rice harvest of Java and Madura are conflicting. The latest reliable estimate of production is for 1944, when the crop was reported at 285 million bushels (4.5 million tons milled), or only 7 percent less than the prewar average. An aerial survey was carried out over Java early in 1946. The results indicated a rice area of 6,725,000 acres in Java and Madura, which is not quite 70 percent of the prewar acreage. Using a yield of 32 bushels per acre, the average during 1936-40, a crop of 215 million bushels (3.4 million tons) would be harvested. This production compares with the average outturn of 307 million bushels (4.8 million tons) before the war.

Reports from Celebes, the Moluccas, Timor, and Borneo indicate that agricultural conditions in those islands have improved substantially since the Japanese surrendered, and that generally favorable weather conditions early in the season were satisfactory for rice crops. The requirements of the Outer Islands, therefore, were believed not to be abnormally heavy, although imports will be needed in the Moluccas, northern Celebes, and eastern districts of Borneo.

As an example of the proportion of the total harvest that the different islands produce, in 1940 an estimate for the rice crop of Netherlands Indies placed the total at 480 million bushels, of which Java and Madura grew about 330 million; Sumatra, 92 million; and Celebes, Bali and Lombok, and Borneo, 21, 15, and 11 million bushels, respectively. This 1940 crop was larger than in previous years. During the 10 years ended with 1940, the total output increased above the former level through a program designed to expand production, which included irrigation projects, improvement of varieties, and legislation requiring specified land to be planted to paddy. The gain that resulted, however, came chiefly from increased acreage rather than from larger yields per acre.

The production of the Indies Islands normally is centered in particular areas so that some localities have surpluses and others require heavy imports. Before the war, Java and Madura together had increased production to such an extent that, instead of importing a net amount to meet requirements, as they did formerly, they exported rice (table 13).

Table 13. - RICE: Imports and exports of the Netherlands Indies, averages 1926-35, annual 1936-40

Year ended December 31	Imports		Exports and reexports		Net imports		
	Java and Madura	Other Islands	Java and Madura	Other Islands	Java and Madura	Other Islands	Total
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
Average:							
1926-30 . . .	263	409	18	3	245	406	651
1931-35 . . .	159	295	8	7	151	288	439
Annual:							
1936	9	247	13	12	a/ -4	235	231
1937	9	186	20	13	a/-11	173	162
1938	25	343	9	9	16	334	350
1939	37	269	13	10	24	259	283
1940	13	106	75	8	a/-62	98	36

a. Net exports.

Compiled from official trade sources.

Some rice is reported as available for exportation from the Netherlands Indies in 1946. If it is taken from areas having a surplus, the scarcity in islands having a deficit may then become more acute.

Iran

In western Asia, prospects early in the planting season of Iran indicated a larger crop in 1946 than last year. The rice-crop estimate for 1945 of 20,720,000 bushels (300,000 tons milled) was 10 percent larger than that of 1944 and compared with the prewar average of 18,577,000 bushels (270,000 tons). In the Persian year March-February 1944-45 total exports equaled 25,000 tons, of which virtually all went to the Soviet Union. Iran has been a net exporter of rice for many years, and it is the only country of the Near East which has a sizable quantity for shipment. Its exports to the Allied countries during the war amounted to about 20,000 tons annually. Prior to 1930 both production and exports were larger than at the present time, exports then averaging about 50,000 tons annually.

Iraq

Information about Iraq's 1946 rice crop is not available. The 1945 production was reduced by 1.5 million bushels (22,000 tons milled) to 12.2 million bushels (175,000 tons) by lack of water supplies in the

early part of the season. This country usually exports relatively small quantities to nearby countries, but rice was in short supply throughout 1945. It was exported only under Government license, export permits equaling 3,300 tons for that year. Because of the shortage, rice prices continue to be extremely high.

Turkey

The 1946 rice acreage of Turkey was expected to be larger than that of last year, particularly in the southern part of the country, where the Government is making an effort to stimulate rice production. In 1945, under the auspices of the Ministry of Health, a successful anti-malarial campaign was waged throughout this area, which is now considered adapted to rice growing. The Government also authorized rice production in other parts of the country. The 1945 crop amounted to 3.7 million bushels (55,000 tons), or about 13 percent less than that of the preceding year, but it was thought to be sufficient for the country's needs.

Net imports of the above-mentioned countries - Iran, Iraq, and Turkey - together with those of other Near Eastern importers, totaled about 85,000 tons annually before the war. Saudi Arabia imported in largest volume, taking about 50,000 tons. Syria and Lebanon, Transjordan, Aden, and the Bahrein Islands are other heavy rice consumers. Since the climate in these countries of low rainfall is unsatisfactory for growing rice without irrigation, their requirements are all imported.

Soviet Union

Before the Union of Soviet Socialist Republics entered the war, the annual rice production was reported at about 20 million bushels (300,000 short tons). At that time imports averaged about 40,000 tons. With the exception of small acreages in southern Ukraine, North Caucasus, and the Far Eastern Maritime Province, rice is grown predominantly in Soviet Central Asia and Transcaucasia.

Europe

In 1946 the area planted to rice in the producing countries of Europe was larger than that of the preceding year. The total production may show a substantial gain over last year's greatly reduced output, but it will not approach the prewar average. The countries of Europe which grow the largest rice crops are Italy and Spain, and rice is also produced in Portugal and the Balkan countries. Given favorable weather through harvesttime, a larger production will be achieved in these countries, for the most part, by means of increased acreages and the use of more fertilizers than were possible to obtain during the war.

Lack of imports into Europe and greatly reduced crops in producing countries left rice virtually out of the European diet during 1946 in

most parts of the continent. Before the war Europe's utilization amounted to more than 2 million tons in terms of milled, of which about 65 percent was imported (table 14). Some rice is trickling into the continent from obscure sources, but this cereal generally is unavailable to the people of Europe.

Table 14. - RICE: Imports (net) a/ into Europe, average 1934-38

Countries	Average 1934-38	Countries	Average 1934-38
	1,000 sh. tons		1,000 sh. tons
United Kingdom	126	Finland	17
Irish Free State	4	Estonia	1
France	621	Latvia	1
Portugal	18	Lithuania	1
Belgium	55	Poland	45
Netherlands	86	Czechoslovakia	65
Denmark	9	Austria	32
Germany	223	Hungary	21
Switzerland	23	Yugoslavia	24
Norway	5	Rumania	27
Sweden	18	Greece	31
		Total	1,453

a. Milled, semimilled, and broken rice.

Compiled from official sources.

Besides the loss of rice normally obtained by imports, a further reduction in supplies occurred by the drop in production as a result of the war. The 1945 harvests of the countries of Europe totaled about 34 million bushels (500,000 tons milled), which indicated a decline from 1935-39 of around 20 million bushels (290,000 short tons milled), or 35 percent. While the shortage of fertilizers was the principal reason for the decline, unfavorable weather, scarcity of labor, and reduced acreages in some areas also were contributing factors. As a result of the decreased outturn, the rice consumption of these countries during 1946 is considerably below average, and there was no rice for export.

Most of Europe's rice imports normally come from the surplus areas of Asia, although some of the European countries before the war were markets for relatively small quantities of United States and Brazilian rice. France imported a large volume from its colony, French Indochina, of which over one-half was used as animal feed during the depression of the 1930's. Most of Germany's rice imports before 1933 came from Burma, but, following a barter agreement with Italy that year, practically all imports were of Italian rice. The Netherlands imported about 200,000 tons of milled and semimilled rice, remilled it, and reexported around

115,000 tons of the milled and broken product, primarily to other European countries, leaving net imports for consumption slightly exceeding 85,000 tons annually. Most of the imports into the Netherlands came from Burma.

Italy

The 1946 rice acreage of Italy is estimated to be about 25 percent larger than in 1945. Although this crop, which will be harvested principally in September, was at first retarded by unfavorable weather, growing conditions improved later in the season. The quantity of fertilizer for application on rice acreage was increased this year, but the amount needed to produce former yields could not be obtained. Rice is the only cereal grown in Italy which is normally exported, and the trade is making plans to have a surplus for export in the future. It may be a few seasons, however, before rice is again available for export.

The 1945 production, unofficially estimated at 20 million bushels (290,000 tons milled), was equal to only 55 percent of the prewar average and less than one-half the peak production of 45.5 million bushels (665,000 tons milled) in 1940. Acreage was greatly restricted by military activities during the planting season, virtually all of this country's rice being grown in northern Italy. Fertilizer and labor shortages were also largely responsible for reducing the average yield per acre from 113 bushels to 84 bushels in 1945. The total rice production is not only too small to permit exports but is also less than domestic needs during 1946. (See table 15.)

Table 15. - RICE: Acreage, production, exports, and apparent utilization in Italy, averages 1930-31 to 1939-40, annual 1940-41 to 1942-43 and 1945-46

Year a/	Acreage	Yield per acre	Production: Rough	Production: Milled b/	Net exports b/	Apparent utilization b/	Per capita consumption b/ c/
	1,000 acres	Bushels	1,000 bushels	1,000 short tons	1,000 short tons	1,000 short tons	Pounds
Average:							
1930-31 to 1934-35	360	94.8	34,139	499	153	346	15.8
1935-36 to 1939-40	362	103.9	37,620	550	147	403	17.5
Annual:							
1940-41. .	404	112.6	45,499	665	135	530	22.6
1941-42. .	414	102.2	42,318	619	25	594	25.2
1942-43. .	398	94.6	37,645	551	17	534	22.6
1945-46. .	238	d/ 84.0	d/20,000	d/ 290	-	290	-

a. Marketing year October-September following harvest.
b. In terms of milled rice equivalent to 65 percent of rough rice.
c. Excludes rice for use other than food. d. Unofficial.

Compiled from official sources, except as noted.

Italy exported about 30 percent of its output during the 10 years preceding the European war, exports of milled and semimilled rice averaging about 150,000 tons annually. Following the barter agreement between Italy and Germany in 1933, the latter country, rather than France, became the principal destination of Italian exports. Switzerland and Hungary continued to obtain most of their requirements from Italy, and some Italian rice went to Yugoslavia.

Spain

The 1946 rice crop of Spain is expected to show an increase, because larger fertilizer supplies were available for use this year than last. Growers hope to obtain better, but by no means prewar, yields, since the procurement of nitrogen fertilizers is not yet up to normal. The fields appeared to be in fairly good condition in August.

Spain, in 1945, had another small rice harvest. Although the acreage planted since the civil war has been well maintained, yields per acre have dropped sharply, largely as a result of the shortage of fertilizers. Production, therefore, has been a low level since 1941.

Spain's rice production was at its highest level from 1926 to 1930. Thereafter, the acreage began to decline; but, because of improved yields, production was maintained at almost the same rate until the civil war began in 1935. The yield per acre in Spain was at that time the highest in the world, averaging 124 bushels per acre. During the same 5-year period, 1926-30, when Spain's exports were at the peak level, a surplus of more than 50,000 tons, in terms of milled rice, was exported annually. In recent years, however, production has been insufficient to meet home needs. Demand is reported to have increased, not only because of scarcity of other cereals, but also because dishes made with rice have become popular since the civil war in almost all sections of the country.

Portugal

The rice area of Portugal in 1946 is estimated at 52,000 acres, or 15 percent larger than in the preceding year, but it is 13,000 acres less than the record of that country. Excessive rainfall retarded transplanting operations early in the season. Consequently, the yield per acre was somewhat reduced, but the harvest is expected to be substantially larger than the small crop of 1945.

The 1945 output of 1,960,000 bushels was the smallest in 13 years and was equal to less than one-half the record production attained in 1941. Prospects for small water and fertilizer supplies caused farmers to plant an acreage only about two-thirds as large as that of 1944. Contrary to expectations, however, higher yields were attained than in

the preceding year. During the war, production about doubled, causing a reduction in imports from approximately 30,000 tons annually to about 5,000. The small 1945 crop resulted in greatly decreased rice consumption during 1946, since imports were unavailable.

Balkan countries

Drought conditions decreased the total 1945 production of the Balkan countries, where rice is a relatively unimportant crop. Bulgaria is the most important producer, its largest crop having exceeded 2 million bushels in 1942. The 1945 crop of the Balkans as a whole is, however, substantially larger than the prewar average, since the expansion of the rice acreage advanced at a remarkable rate during the war period. Imports into these countries during 1935-39 averaged 96,000 tons annually as follows: Greece, 32,000; Hungary, 20,000; Rumania, 23,000; and Yugoslavia, 21,000 tons. Bulgaria was a net exporter of a small quantity.

Africa

An increase in the rice production of Africa has been gradual but marked during the past 15 years. The estimated outturn of 125 million bushels (1.8 million short tons milled) in 1945-46 is 35 million bushels (500,000 tons) larger than the crops of the early 1930's. While a gain of 17 percent occurred from 1930 to 1940, production in 1945-46 was 20 percent larger than the prewar average. The output of Egypt accounted for most of the rise, but crops in other parts of Africa also increased. Where it could be grown rice was produced, as a result of the war, in all the countries that formerly imported large quantities. Although it is too early to forecast production in 1946-47 in some countries of Africa, the outturn in the exporting countries is expected to be less that in 1945-46.

The rice production of Africa is located predominantly in Egypt, the one country that exports a relatively large volume, and on the island of Madagascar. Considerable quantities are also produced in French West Africa and Sierra Leone, where production during the war is reported unofficially to have increased by about one-half the former imports. In the countries of British East Africa, both floods and dry weather in 1945-46 caused deterioration of crops, and the relatively small imports which became necessary in 1946 finally were procured from Nyasaland. Tanganyika, the largest producer in this area, usually grows rice to supply the requirements of nearby countries, but in 1945-46 the largest crop ever planted was greatly reduced by drought, which virtually eliminated rice exportation that season.

Belgium Congo, Angola, and Portuguese Guinea normally grow small surpluses for export, Angola and Portuguese Guinea sending their rice to Portugal. The actual size of the outturn is difficult to ascertain in

several countries of Africa because of the shift in planting from one plot of ground to another. Production may therefore be larger than reported in some localities.

Africa imported about 350,000 tons of milled rice before the war. In a number of countries this cereal ranks high in the diet of the people. The Union of South Africa, Mauritius, and French West Africa each imported more than 50,000 tons annually. Most of the imports came from Asia; those into the French colonies generally from French Indochina; and the others from Siam and Burma. (See table 16.)

Table 16. - RICE: Imports into Union of South Africa, average 1936-40, annual 1941-44

Country of origin	Average 1936-40	1941	1942	1943	1944
	Short tons	Short tons	Short tons	Short tons	Short tons
India	34,579	44,676	22,534	741	225
Burma	a/ 3,529	9,451	2,122	(b)	0
Indochina	4,931	65	(b)	0	0
Netherlands Indies	284	17,053	1,667	0	0
Siam	25,898	8,651	21	0	0
Brazil	95	316	3,733	7,265	21,657
United States	11	50	2	1,266	428
Others	184	2,192	833	2,404	405
Total	69,511	82,454	30,912	11,676	22,715

a. 1938-40. Burma included with India prior to 1938.
b. Less than 1,000 pounds.

Annual Statement of the Trade and Shipping of the Union of South Africa.

Egypt

In Egypt, the September-October harvest of 1946 is unofficially forecast at 40 million bushels (585,000 tons milled) compared with 42.5 million bushels (620,000 tons) the preceding year, and the prewar average of 33 million bushels (480,000 tons). The area planted to rice was about 620,000 acres against 665,000 planted in 1945. (See table 17.) The 1946 increase of 240,000 acres planted to cotton reduced the area planted to cereals. In addition, limited fertilizer imports and prospects of low water supplies early in the season discouraged planting the maximum rice acreage.

The near-record 1945 crop was surpassed only by production in 1942. The acreage was limited early in the season by the small flow of the

Nile River, but warm weather in August benefited the crop and resulted in above-average yields. This cutturn showed a gain of almost 10 million bushels, or 145,000 tons milled, over prewar production. The increase was achieved largely by an expansion in acreage of 200,000 acres planted principally as a wartime measure to help provide rice for the Allied countries. Since the annual water supply is sufficient only for a given acreage each year, this land may again be used for raising cotton when the need for rice diminishes on the world market. Both the acreage and production of rice in this country vary from year to year, the acreage being determined by available water supplies rather than from actual intentions to plant.

Table 17. - RICE: Production, trade, and utilization in Egypt, averages 1931-40, annual 1941-46

Year	Acreage a/	Yield per acre a/	Production a/		Net exports b/	Apparent utilization b/
			Rough	Milled b/		
	1,000 acres	Bushels	1,000 bushels	1,000 sh. tons	1,000 sh. tons	1,000 sh. tons
Average:						
1931-35	352	59.3	20,876	305	73	232
1936-40	463	71.6	33,155	485	132	353
Annual:						
1941	528	61.9	32,678	478	69	409
1942	465	60.3	28,044	410	2	408
1943	699	65.9	46,044	673	114	559
1944	667	50.3	33,570	491	170	321
1945	643	62.1	39,908	584	74	510
1946	665	63.8	42,454	621	c/ 220	c/ 401

a. Harvested September-October before given calendar year of trade and utilization.
b. In terms of milled rice equivalent to 65 percent of rough rice.
c. Estimated.

Compiled from official sources.

Madagascar

Madagascar's 1946-47 rice crop is unofficially forecast at 35 million bushels (550,000 tons milled) compared with 38 million bushels (600,000 tons) the year before and with the prewar average of 33.8 million bushels (530,000 tons). Scarcity of labor was an important reason for a decline in acreage planted.

The 1945-46 production in Madagascar was the largest crop harvested in 5 years and was about 20 percent above the small return of the

preceding year. The acreage showed a substantial increase over that of a year earlier, but late drought conditions prevented a rise in output proportionate with the increase in area. The 1945-46 acreage almost approached that of two decades ago, when production was substantially larger than in recent years and exports amounted to about 25,000 tons annually.

Less rice was exported during 1945 than in 1944, exports for the 2 years equaling 13,000 and 20,000 tons, respectively. Exports during the first half of 1946 amounted to 5,000 tons. Shipments normally represent about 5 percent of the crop; the remainder is consumed domestically, most of it in producing areas by the growers themselves. Upon procurement by the Government, rice was rationed until February 1946 at 300 grams (about 11 ounces) daily for Europeans and 400 (14 ounces) for natives.

Oceania

In Oceania the difficulty of obtaining rice imports after the war began brought about an increase in the production of that area. The harvest of April-June 1946 amounted to about 4,700,000 bushels (70,000 tons), which was substantially larger than in 1945, when climatic conditions in important areas were unfavorable for rice growing. Information from some parts of the South Pacific area indicate that during the war the rice acreage was increased wherever possible to help make up for the lack of imports. Rice normally had been imported from Asia's surplus countries, which were occupied by the Japanese.

Australia

The largest production of Oceania is in Australia. That country's 1946 crop of 2,600,000 bushels (40,000 tons milled), although larger than the virtual crop failure of the preceding year, was more than 30 percent short of the record crop of 1944. Inadequate water supplies at the time of planting restricted the area sown to rice. The Australian rice acreage was extended during the war to help supply the allied countries with food.

Australia formerly exported an average of 10,000 tons of milled rice annually. During the war, however, larger exports were delivered to the British and French Oceania islands, record exports being 40,000 tons during July-June 1943-44. To help meet the problem created for the United Nations when rice imports into the South Pacific islands were cut off, Australia also prohibited the consumption of rice by its civilian population to provide exports for these islands.

South Pacific Islands

One example of the endeavor in the South Pacific Islands to increase rice production is that of the Fiji Islands. Its harvests from 1943-44

to 1945-46 were about double the former output. The record area of the 1943-44 season was 28,000 acres, on which 1,100,000 bushels (17,000 tons milled) were produced. Because of the small yield obtained that year from plantings on submarginal land, the acreage thereafter was not so large. Weather conditions this year were reported favorable for the May-June harvest. The rice consumption of the Fiji Islands is unusually high, that of a large part of the population being around 250 pounds per capita, which exceeds the heaviest consumption in the Western Hemisphere.

One of the reasons for the importance of rice in the diet of the native population on many of the islands is that it keeps longer than other cereals during the rainy seasons. The relatively low imports, in comparison with those of other countries, are explained by the small populations inhabiting these islands. The normal imports of the islands included in the Allied controlled territory averaged about 23,000 tons annually, coming from southeastern Asia. Imports of islands which were occupied by the Japanese also had averaged about 20,000 tons annually before the war. (See table 18.) Total requirements of this region about doubled, therefore, as far as the Allied countries are concerned, when the islands held by the Japanese were freed at the close of the war.

Table 18. - RICE: Imports (net) into specified islands of the South Pacific, average 1934-38

Countries	Average 1934-38
	1,000 short tons
British Oceania:	
New Zealand	4
Fiji Islands	2
Gilbert & Ellice	1
Solomon Island	2
New Britain	10
Papua	3
Western Samoa	1
French Oceania:	
New Caledonia	3
Other French Oceania	1
New Hebrides	2
Japanese Pacific Islands	a/ 14

a. 1934-37.

Compiled from official sources.

Table 19. - Rice production in the Western Hemisphere, averages 1925-26 to 1939-40, annual 1941-42 to 1945-46

Country	Average 1925-26 to 1929-30	Average 1930-31 to 1934-35	Average 1935-36 to 1939-40	1941-42	1942-43	1943-44	1944-45[a]	1945-46[a]
	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels	1,000 bushels
South America:								
Argentina	377	1,054	3,112	5,296	4,852	8,559	6,807	7,736
Bolivia	[b] 600	[c] 554	[c] 581	-	498	-	-	-
Brazil	43,628	58,970	66,449	93,230	92,205	103,322	[d] 102,880	[d] 115,130
British Guiana	2,801	3,445	3,559	4,236	4,068	4,362	4,812	-
Chile	0	18	1,299	3,008	5,701	7,340	7,862	5,778
Colombia	[c] 882	[c] 2,508	3,378	5,430	5,830	5,901	5,923	6,030
Ecuador	[c] 2,500	2,212	3,439	5,718	7,607	6,075	4,850	7,630
French Guiana	-	-	[b] 2	4	5	-	6	-
Paraguay	[b] 150	240	196	363	377	484	294	390
Peru	3,362	4,551	4,578	4,897	5,706	6,761	6,406	7,500
Surinam	[c] 865	1,078	1,703	2,629	1,879	1,577	1,685	1,724
Uruguay	[c] 16	[c] 284	866	889	759	849	1,030	1,423
Venezuela	-	[b] 50	[b] 275	301	754	882	-	-
Total [e]	55,181	74,964	89,437	126,640	130,241	146,700	144,700	160,500
North America:								
Mexico	4,024	3,478	4,007	5,357	5,300	5,609	5,801	[d] 6,125
United States	40,585	41,572	49,852	51,323	64,549	64,843	68,161	70,160
Total	44,609	45,050	53,859	56,680	69,849	70,452	73,962	76,285
Caribbean area:								
Cuba	[b] 923	[b] 1,026	1,026	1,444	1,400	2,222	1,778	2,051
Dominican Republic	[b] 530	1,517	2,905	3,389	3,139	3,185	[d] 3,020	[d] 3,290
Haiti	[b] 50	[b] 110	[b] 165	[b] 330	588	392	374	-
Trinidad & Tobago	[b] 120	[b] 180	[b] 300	398	470	[b] 675	700	700
Total	1,623	2,833	4,396	5,561	5,597	6,474	5,872	6,640
Central America:								
British Honduras	-	3	3	13	6	4	8	8
Costa Rica	[b] 300	871	[c] 839	673	749	670	635	967
El Salvador	[b] 250	[c] 314	639	1,012	1,200	1,197	934	800
Guatemala	105	172	541	920	1,018	1,314	673	480
Honduras	[b] 30	[c] 241	401	570	635	482	800	1,150
Panama	[b] 900	[b] 960	[b] 1,600	2,142	3,058	-	2,291	-
Nicaragua	[b] 500	[c] 500	[c] 600	780	790	749	466	950
Total	2,085	3,061	4,623	6,110	7,456	7,215	5,807	6,360
North America	48,317	50,944	62,878	68,351	82,902	84,141	85,641	89,285
Western Hemisphere	103,500	125,900	152,300	195,000	213,100	230,800	230,300	250,000

One bushel of rough rice is equivalent to 29.25 pounds of milled rice.

a. Preliminary.
b. Estimate.
c. Less than 5-year average.
d. Unofficial.
e. Totals are estimated if data are incomplete.

WESTERN HEMISPHERE

The rice harvest of the Western Hemisphere ended in July 1946 was the largest yet obtained, following the almost uninterrupted increase in production every year since the war began. The outturn of 250 million bushels (3.7 million tons milled) was 20 million bushels (300,000 tons milled) more than that of the preceding year and 100 million bushels (1 1/2 million tons) larger than the prewar average. Despite the fact that this gain represents an extremely small proportion of the world rice crop, it marks a phenomenal change in the rice economy of the Western Hemisphere. (See table 19.)

Whereas, rice imports (net) of 240,000 tons were necessary to meet the requirements of the Western Hemisphere countries before the war (table 20), an estimated 350,000 tons are being exported (net) from the 1945-46 production, this in addition to supplying in part the increased consumption requirements of this Hemisphere. Through larger production, countries which formerly exported rice have increased their exports (table 21). Most of those which imported relatively large quantities now grow their own requirements and also have rice for export. A few countries still import some rice in order to meet requirements, but the quantities taken are substantially below prewar imports.

The rice consumption of the Western Hemisphere in 1946 is estimated at 3.3 million tons, or slightly more than in the past year and 800,000 tons more than in prewar years. This rise is attributed primarily to increased population and to greater purchasing power in countries of production since the war began. In some countries where utilization during the world scarcity is dependent upon imports from producing areas of this Hemisphere, as in the Caribbean, the total rice consumption either is smaller than, or is about equal to, the prewar average. The per capita consumption is less than in prewar years in nearly all the Caribbean countries. (See fig. 4.)

South America

The upward trend of South American rice production rose sharply in 1945-46, continuing the rapid expansion of the past two decades. The extent of the increase since the war started appears to have surpassed even the most optimistic expectations. Production of 160 million bushels of rough rice (2.3 million tons milled) in 1945-46 was 70 million bushels (1 million tons) larger than the prewar average and more than 100 million bushels (1.5 million tons) larger than the production of 20 years ago.

Of the rice produced in the Western Hemisphere, South America's proportion is larger this year than last, this continent having advanced from 60 percent of the total to almost 65. Although the largest quantitative increase in production over prewar harvests took place in Brazil,

Table 20. - RICE: Imports a/ into Western Hemisphere countries, averages 1926-40, annual 1942-45

Country	Average 1926-30	Average 1931-35	Average 1936-40	1942	1943	1944 b/	1945 b/
	Sh. tons	Sh. tons	Sh. tons	Sh. tons	Sh. tons	Sh. tons	Sh. tons
South America:							
Argentina	70,353	44,217	26,143	222	0	6,549	112
Bolivia	5,163	2,070	9,186	12,048	4,342	12,558	11,813
Brazil	1,873	21	0	0	0	0	-
Chile	23,002	14,491	12,054	1	-	-	-
Colombia	48,678	16,469	14,807	26	26	17	-
French Guiana	1,141	1,284	1,346	-	-	-	-
Paraguay	477	100	163	-	-	-	-
Peru	25,155	4,466	22,371	7,280	5,770	20,552	14,132
Uruguay	9,124	5,100	95	(c)	-	73	-
Venezuela	13,553	12,481	16,462	12,528	1,618	10,592	-
Others	455	406	7	-	-	-	-
Total d/	198,974	101,105	102,634	33,100	12,700	51,500	30,000
North America:							
Canada	21,297	23,480	25,479	17,055	31,793	17,612	19,524
Mexico	1,384	182	173	19	602	1	343
United States	27,448	11,987	10,267	2,860	4,397	5	1,094
Others	418	412	e/ 469	-	-	-	-
Total d/	50,547	36,061	36,388	20,450	37,300	19,500	22,000
Caribbean area:							
British West Indies	39,192	48,594	e/59,420	-	-	-	-
Cuba	232,152	179,357	222,306	171,154	221,139	227,762	192,193
Curacao	572	681	e/ 1,176	-	1,461	-	-
Dominican Republic	28,673	14,335	3,994	(c)	(c)	(c)	-
French West Indies	9,092	11,722	e/12,284	-	-	-	-
Haiti, Republic of f/	5,096	2,161	1,180	13	(c)	(c)	(c)
Total d/	314,777	256,850	300,360	215,000	258,000	260,000	238,000
Central America:							
British Honduras	1,111	1,143	1,382	873	848	1,254	-
Costa Rica	4,643	1,762	1,026	26	2,610	5,203	5,434
El Salvador	266	5	2	118	71	20	-
Guatemala	1,001	480	38	165	70	0	125
Honduras g/	1,871	2,263	1,295	630	278	732	198
Nicaragua	1,255	813	259	1	34	-	-
Panama	9,924	8,640	6,699	4,821	3,177	5,609	-
Total d/	20,071	15,106	10,701	6,634	7,088	12,800	12,000
North America	385,395	308,017	347,449	242,000	302,400	292,300	272,000
Western Hemisphere d/	584,369	409,122	450,083	275,200	315,100	343,800	302,000

a. Includes milled and rough rice in terms of milled converted at 65 percent. b. Preliminary. c. Less than 1,000 pounds. d. Totals are estimated if data are incomplete. e. Less than 5-year average. f. October-September. g. July-June.

Compiled in the Office of Foreign Agricultural Relations.

Table 21. - RICE: Exports a/ from Western Hemisphere countries, averages 1926-40, annual 1942-45

Country	Average 1926-30	Average 1931-35	Average 1935-40	1942	1943	1944 b/	1945 b/
	Sh. tons	Sh. tons	Sh. tons	Sh. tons	Sh. tons	Sh. tons	Sh. tons
South America:							
Argentina	158	292	234	173	86	100	3,003
Bolivia	1	0	0	-	-	-	-
Brazil	15,388	55,207	41,667	91,023	93,199	165,121	95,391
British Guiana	15,484	23,859	17,148	25,177	19,242	27,544	28,467
Chile	56	6	2	9,317	25,362	30,567	46,515
Colombia	0	0	2	838	116	64	-
Ecuador	7,774	10,930	12,842	42,603	52,962	71,214	32,318
Paraguay	0	2	0	139	1,014	2	-
Peru	251	855	26	4,292	0	0	-
Surinam	859	2,050	c/6,232	-	-	-	0
Uruguay	-	0	1,887	1,330	846	-	2
Total d/	39,971	93,201	80,040	174,892	198,412	295,000	205,000
North America:							
Canada e/	271	339	1,263	4	11	467	226
Mexico	7,272	8,367	9,277	25,628	3,498	0	0
United States	113,388	76,780	117,603	175,007	298,473	242,490	254,454
Total	120,931	85,486	128,143	200,639	301,982	242,957	254,680
Caribbean area:							
British West Indies e/	477	184	c/ 235	-	-	-	-
Dominican Republic	-	7	82	10,295	4,602	35	5,089
Haiti f/	-	0	1	408	1,620	338	296
Others g/	108	120	70	-	-	-	-
Total d/	585	311	388	10,700	6,200	500	5,500
Central America:							
British Honduras	2	41	c/ 50	-	-	-	-
El Salvador	0	0	1,320	2,035	5,307	4,288	-
Guatemala	0	0	(c)	255	236	543	76
Honduras h/	14	150	1	(i)	179	332	36
Nicaragua	26	317	75	1,013	2,924	-	-
Total d/	42	508	1,446	3,300	8,700	5,500	5,000
North America	121,558	86,305	129,977	214,600	316,900	249,000	265,200
Western Hemisphere d/	161,529	179,506	210,017	389,500	515,300	544,000	470,000

a. Includes milled and rough rice in terms of milled converted at 65 percent.
b. Preliminary
c. Less than 5-year average.
d Totals are estimated if data are not complete.
e. Reexports.
f. October-September.
g. Includes reexports from Cuba, French West Indies, and Curacao.
h. July-June.
i. Less than 1,000 pounds.

Compiled in the Office of Foreign Agricultural Relations.

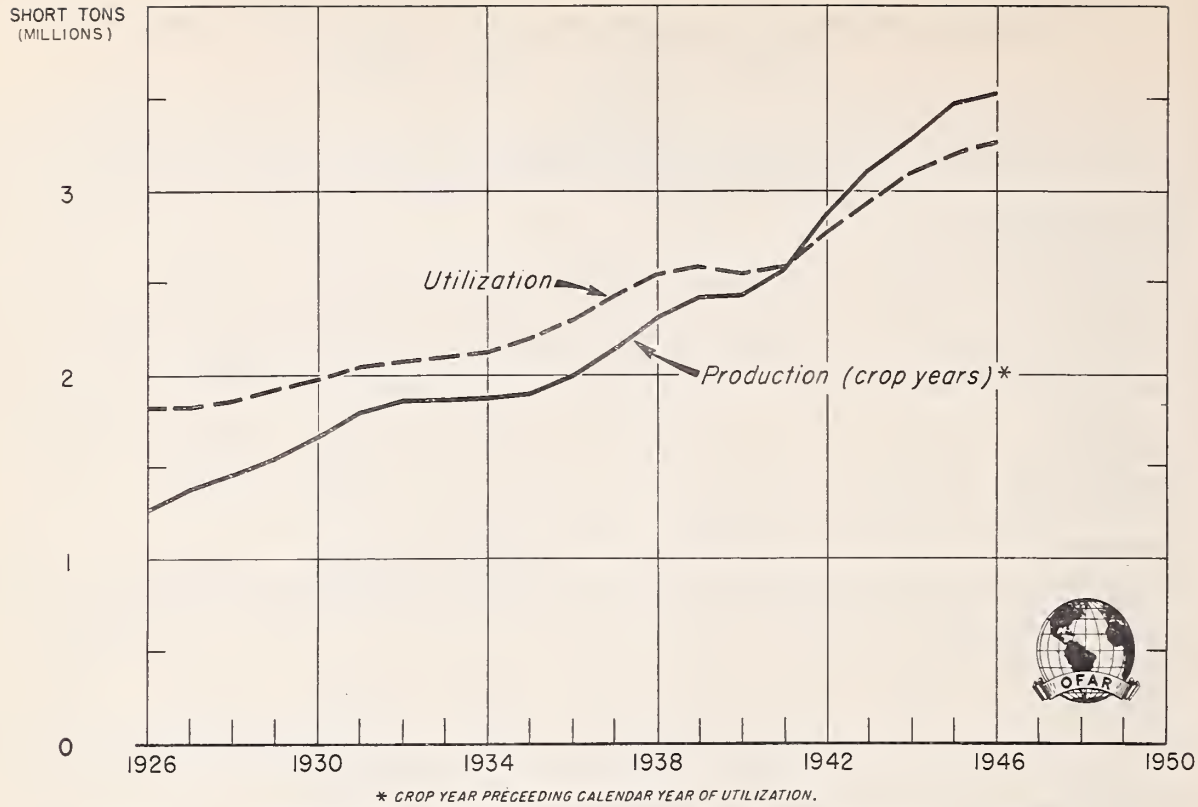

Figure 4. - RICE (milled): Production and utilization, in the Western Hemisphere, 1926-46.

the percentage gain was larger in the other countries, their annual production being about twice their prewar average outturn.

The gain in output supplied South America not only with more rice for consumption, but also with an increased volume for export. Rises in purchasing power, increases of population, and the availability of local rice supplies in countries of production also contributed to a pronounced expansion of domestic consumption during the war. Since the war, as available supplies of bread grains have diminished, more and more of South America's rice output is being locally consumed.

South America was about self-sufficient in rice at the beginning of the war, but its increased output in succeeding years proved a source of supply for the Allied countries. Exports in 1945 of around 200,000 tons from the 1944-45 crop were less than the record of the preceding year, largely because drought reduced the harvest in the Brazilian region, which ordinarily grows the largest quantity for export. Exports in 1946, however, are expected to exceed those of any previous year.

Next season's acreage of some South American countries will probably be at least as large as in 1945-46 and perhaps larger in some countries.

In other areas, however, rising prices of other crops may cause some decrease in acreage. In South America, rice is harvested in the south chiefly from February through May and in the north principally from October to January. It is grown the year around in those countries on or near the Equator.

Brazil

Of the South American countries, Brazil, by increasing production after supplies were cut off in the Far East, made the largest contribution of rice to the war effort of the United Nations. Its record 1946 harvest of 115 million bushels (1,680,000 tons milled) showed an increase of 12 million bushels (180,000 tons milled) over the crop of the preceding year and was about 50 million bushels (730,000 tons) larger than the prewar average crop (table 22). This year average to bumper crops were harvested in most of the States.

The total exportable supplies available in Brazil from that crop are the largest on record, although the amount actually exported is contingent on wheat imports, which have been considerably less than normal this year. The largest crop yet produced in the State of Rio Grande do Sul was harvested from April to June in 1946. This State in past years shipped about 90 percent of Brazil's rice exports (table 23). Its exportable surplus greatly increased over that of former years for two reasons: (1) The record crop and (2) prospects for a reduction in shipments to other Brazilian States because of large output in central Brazil.

Table 22. - RICE: Production, trade, and utilization in Brazil, averages 1926-40, annual 1941-46

Year	Production		Net exports	Apparent utilization
	Rough	Milled		
	1,000 bushels	1,000 s.tons	1,000 s.tons	1,000 s.tons
Average:				
1926-30 . . .	43,628	638	14	624
1931-35 . . .	58,970	862	55	807
1936-40 . . .	66,449	972	42	930
Annual:				
1941	82,674	1,209	14	1,195
1942	93,230	1,363	91	1,272
1943	92,205	1,348	93	1,255
1944	103,322	1,511	165	1,346
1945 a/.	102,880	1,505	95	1,410
1946 a/.	115,130	1,684	-	-

a. Preliminary and unofficial forecast.

Compiled from official sources, except as noted.

Table 23. - RICE: Exports from Brazil, by countries of destination, average 1936-40, annual 1941-45

Country of destination	Average 1936-40	1941	1942	1943	1944	1945
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
Argentina	a/ 20	1	(b)	0	7	0
Bolivia	2	2	(b)	(b)	(b)	(b)
United Kingdom . . .	2	2	50	61	110	81
Germany	4	0	0	0	0	0
Sweden	(b)	0	16	7	5	0
Switzerland	1	0	6	9	7	0
France	4	0	0	0	0	0
Union of South Africa	(b)	1	6	9	21	9
Others	9	c/ 8	d/ 13	7	15	5
Total	42	14	91	93	165	95

a. Virtually all exported as rough rice; converted to milled basis at 65 percent.

b. Less than 500 tons.

c. 5,000 tons to United States; 3,000 to French West Indies.

d. 5,000 tons to Puerto Rico; 3,000 to Ireland, and 3,000 to French West Indies.

Compiled from official sources.

In an agreement with Brazil made in December 1943, the United Kingdom and the United States obligated themselves to purchase the entire surplus of the 1943-44 and 1944-45 crops at specified prices. The agreement stipulated, however, that consumption requirements of all Brazilian States should first be provided. In June 1945 this agreement was extended to cover the 1945-46 and 1946-47 production, the only changes being that rice prices f.o.b. were raised 10 percent and the allowable percentage of broken rice was increased from 10 to 20 percent.

At the beginning of 1946, about 50,000 tons of rice stocks were at Santos, São Paulo, available for export. Partly because domestic prices were higher than the export price, this surplus failed to be exported during the first half of 1946. As a consequence, a bonus of 12.5 percent over the agreement price was offered by the United Kingdom, which became effective May 21, 1946. The export price paid for rice was raised to $6.52 (1 cruzeiro being equivalent to 0.053 U. S. cent) per 100 pounds for long-grain "Agulha" rice, the principal type being exported.

According to the memorandum of understanding, of December 1943, the British Ministry of Food was to procure all the exportable surplus from

these crops, except 10,000 metric tons (11,000 short tons) each year for other Latin American countries.

The 1946-47 acreage in Brazil may not be so large as in the past season because of the rise in prices of other field crops. The irrigated acreage of Rio Grande do Sul is expected to remain at or above that of 1945-46 as long as world rice prices remain at their current level.

Ecuador

Ecuador's rice output, by supplying increased exports since 1941, was also a help to the Allied war effort. Stimulated by high prices, production expanded every year, except one in which export restrictions discouraged producers from planting. The 1946 outturn is expected to exceed all previous crops and be twice the size of prewar production. This country's output could be further increased, because its climate and soil are adapted to rice cultivation.

Although Ecuadoran rice exports during 1946 are expected to be considerably larger than last year's reduced shipments, they may not exceed the record set in 1944 (table 24). By decree of April 3, 1946, the law requiring permits for rice exportation was abrogated, and, beginning on that date, all rice could be exported free, except 30,000 tons, the amount earmarked for domestic needs. Consumption was estimated at 37,500 tons, the same as last year, but the remainder was expected to be supplied from stocks on hand.

Table 24. - RICE: Exports from Ecuador, by countries of destination, average 1939-41, annual 1942-45

Country of destination	Average 1939-41	1942	1943	1944	1945	January-June 1945	January-June 1946
	1,000 s. tons	1,000 s. tons	1,000 s. tons	1,000 s. tons	1,000 s. tons	1,000 s. tons	1,000 s. tons
Cuba	1	14	41	44	28	11	6
Peru	4	4	10	15	0	0	0
Venezuela	5	10	0	8	2	(a)	6
Colombia	3	0	(a)	0	(a)	(a)	0
Panama	2	12	2	1	(a)	0	1
Others	3	3	(a)	3	2	(a)	(a)
Total	18	43	53	71	32	11	13

a. Less than 500 tons.

Compiled from official sources.

This ruling was revised, however, by decree of August 31, which requires exporters to register for sale to the Directorate of Foodstuffs 60 percent of the unhulled rice they purchase for export, instead of 25 percent of the hulled rice as formerly. This applied to rice received at mills subsequent to August 31.

The acreage of the main crop to be planted in Ecuador, beginning next January, is expected to exceed the wartime expanded acreage. Rice may be planted in place of cotton as long as the income from rice continues higher.

Chile

Following a series of record crops in Chile, the March-April-1946 harvest dropped sharply below that of the preceding year. Despite a gain of 7 percent in the rice area, cold weather and storms during the growing season caused a decrease in the yield per acre, which considerably reduced the harvest. Rust also adversely affected the size and quality of the crop. (See table 25.)

Table 25. - RICE: Production, trade, and utilization in Chile, averages 1926-40, annual 1941-46 a/

Year	Production		Net		Apparent utilization
	Rough	Milled	Imports	Exports	
	1,000 bushels	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
Average:					
1926-30 . . .	0	0	23	-	23
1931-35 . . .	18	(b)	19	-	19
1936-40 . . .	1,299	19	12	-	31
Annual:					
1941	2,206	32	-	4	28
1942	3,008	44	-	9	35
1943	5,701	83	-	25	58
1944	7,340	107	-	36	71
1945	7,862	115	-	47	68
1946	5,778	85	-	-	-

a. Includes milled rice and rough rice in terms of milled converted at 65 percent.
b. Less than 500 tons.

Compiled from official sources.

Chile began to grow rice about 1935, and in 1941 the crop of 2.2 million bushels (32,000 tons milled) supplied sufficient rice for consumption with some for export. After the war started, continued increased

production brought Chile into the market as an important source of rice for the Allied countries. While the surplus was small in proportion to world demand, it was one of few sources of supply. During the war, rice was exported primarily to Cuba, Bolivia, and Peru. In 1945, the largest quantity, 16,000 tons, went to the Philippine Islands, 5,000 tons each to Panama and Venezuela, and some quantities continued to be exported to Cuba and Bolivia.

The 1946-47 acreage is expected to decrease because of scarcity of irrigation water and low ceiling prices. Early indications are for an increase in the barley acreage of the north central zone at the expense of rice.

British Guiana

Figures showing 1945-46 rice production in British Guiana are not yet available. Reports state, however, that both acreage and output probably were greater than in the preceding year, when a record crop of 4,800,000 bushels (70,000 tons milled) was 35 percent larger than the prewar average.

Efforts to increase production have proved quite successful in recent years, and probably will continue. Expansion of the industry is under the auspices of the Rice Marketing Board, a Government organization, which controls the production and marketing of rice. Two years ago, as one measure to increase the outturn, a project of experimentation in rice cultivation with the application of modern techniques was set up on the Mahaicony and Abary Rivers in northern British Guiana. The project includes increased drainage and irrigation, large-scale mechanical cultivation, and modern centralized milling.

Last year the Government approved $1,000,000 for the development of the rice-industry program. Over two-thirds of this sum was for the procurement of mechanical equipment, and the remainder, for a new central rice mill, on which construction was begun in 1945; cultivation experiments; and other rice-expansion schemes. Importation of rice-milling machinery, virtually all of United States manufacture, rose from a value of $22,000 in 1944 to $59,000 last year.

British Guiana has been a consistent exporter of rice since the turn of the century. It ranked second to Brazil among the rice-exporting countries in South America until 1938, when Ecuador's exports gained second place. Consumption amounts to almost 30,000 tons annually, and the difference is exported to the British West Indies, mainly to Trinidad and Tobago. British Guiana was virtually the only source of rice imports into the West Indies during the war. British Guiana's exports to these islands usually are in the form of parboiled, or "Demerara," rice. Increased production in future years might supply the British West Indies with all their postwar requirements.

Colombia

The Colombian 1946-47 rice harvest beginning in October may be reduced below last year's production by lack of rainfall. The late occurrence of fall rains helped yields somewhat in the rice-growing areas along the coast, but weather prospects in some other localities early in September were uncertain. Exports were to be suspended until the new crop was appraised.

Colombia's 1945-46 record harvest was slightly larger than that of the preceding year and was 80 percent above prewar production. A strong protectionist policy before the war and high prices in recent years have been responsible for a steady gain in rice growing in this country. In 1940 the Government passed a decree limiting imports until January 1, 1943, when it prohibited the issuance of import licenses, except in the event of a serious rice shortage. High prices as a result of the world scarcity during the war proved a further incentive for increased output.

The outcome of the consequent rise in production is that Colombia exported 8,000 tons of rice to Cuba from January to August 1946. Exportation of this quantity is unusual, because two decades ago almost 50,000 tons of rice were imported each year to meet requirements. Production during the war was about sufficient for increased domestic needs, some imports being necessary in 1944 and 1945.

Argentina

In Argentina, the near record crop harvested in March-April 1946 was exceeded only by production of 1943-44. The acreage was 5 percent less than that of the preceding year, but the yield was higher so that total production showed a gain over the previous season's poor harvest. The 1945-46 crop was about two and one-half times the output during the prewar period. The gain in Argentine rice production in the past two decades has been outstanding. This country formerly ranked second only to Cuba among the rice-importing countries of the Western Hemisphere. Then importing 70,000 tons and producing 5,000, by 1942 it was growing all requirements, which had increased to about 80,000 tons.

About 3,500 tons were exported from January to May 1946 from the 1945-46 crop. Most of these exports went to Belgium. In June 1946, however, the Government announced that permits for export were suspended. On September 6, an export quota of 8,200 tons of milled and brokens was authorized up to April 20, 1947.

This country's former heavy imports were chiefly in the form of rough rice, which was milled in Argentina. Most of this rough rice was imported from Brazil, and some was received from the United States.

Peru

The 1946 May-August harvest of Peru was the largest ever produced in that country, being about 3 million bushels (45,000 tons milled) larger than the prewar average. Production since the war has increased as a result of plantings made on new land found suitable for growing rice; and, particularly in the past two seasons, as a result of increased yields obtained by transplanting rather than broadcasting rice seed as formerly was customary. The increased costs of production and relatively lower returns to producers in this country may have some effect on future output. Information about the area to be planted to rice in 1947 is not available, but the increased area of recent years may be maintained.

Requirements of rice, one of Peru's staple foods, had been satisfactorily met up to 1946 through a Government program of supply and distribution. The large 1946 crop is not only sufficient for increased domestic needs but also for small exports, provided rice is not substituted for other cereals during the current shortage of bread grains. Rice consumption normally amounts to about 110,000 short tons a year.

Supplies in recent years have been in the hands of the Government, which purchased the domestic crop and controlled imports. On May 15, 1946, the Government for the fourth consecutive year bought all the rice produced, except that grown this year in five Departments, at the price established in May 1943: $2.82 per 100 pounds for unhulled white rice and $1.95 for unhulled pink rice. From 5,000 to 20,000 tons were also imported annually for consumption during these years, chiefly from Ecuador and Chile.

Surinam

The 1945 rice harvest of Surinam was slightly larger than production the year before, but it did not come up to expectations, since yields were reduced by adverse weather during the early part of the growing season. The cultivation of rice is rapidly becoming the leading agricultural crop of this country. It has always been important, the output before the war being sufficient for domestic requirements and for the exportation of about 7,500 tons annually. During the war, however, rice was not exported; labor shortages caused the acreage to decline, crops were poor, and domestic requirements were greater.

Rice is a staple food in Surinam. The per capita consumption of about 230 pounds a year is one of the largest in the Western Hemisphere. Rice exports were prohibited in 1945, and production was adequate for requirements. In 1946, however, 1,000 tons were set aside for exportation. The acreage planted to rice for the 1946 harvest increased 10 percent over the previous year.

Uruguay

The gain in Uruguay's rice outturn of March-April 1946 over the preceding year was pronounced. The crop of 1,400,000 bushels (20,000 tons milled) compares with the previous record of 1,030,000 bushels (15,000 tons) in 1945. Production in recent years has been gradually increasing and is now about double the prewar average. If Uruguay's other food supplies were up to normal, about 5,000 tons of rice would be available for export. Uruguay normally exports from 1,000 to 2,000 tons a year, but because of shortages of other foodstuffs no exports of rice are expected in 1946.

Paraguay

Paraguay's harvest of March-April 1946 was forecast as a near-record crop. In the southern part of the country, however, growers suffered heavy losses after harvest as a result of prolonged wet weather in June and July. The Paraguayan rice output is, with the exception of French Guiana's, the smallest in South America, amounting to 390,000 bushels (5,700 tons milled) in 1945-46. Even so, production in recent years has expanded sufficiently to meet domestic requirements and allow some for exportation, whereas minor quantities were imported before the war. At that time the annual per capita consumption of approximately 4 pounds also was about the lowest in the Western Hemisphere.

Venezuela

Statistics are not available for Venezuelan rice production. The annual harvest is now in the neighborhood of 1 million bushels (15,000 tons milled), which is five times as large as the prewar outturn. The 1945-46 crop was not large enough to furnish Venezuela's requirements, and, up to July 1946, 6,000 tons had been imported. In recent years, rice has been obtained primarily from Ecuador.

The planting of rice was just beginning in Venezuela 10 years ago. Production has benefited by Government measures to aid the industry, such as the granting of credit and machinery, providing a technical advisory office, and supplying growers with seed.

Bolivia

The Bolivian 1946 rice harvest, which began in April, was considerably larger than the small 1944 and 1945 crops, which were reduced by dry weather. The acreage was substantially increased for the 1946 harvest, partly by sowing on newly cleared land and also by additional plantings on army-operated farms.

This new production, according to reports, is augmenting supplies in the Santa Cruz region, the principal producing area. Because of the

previous small crops, imports into Bolivia of about 12,000 tons were necessary in 1944 and 1945, but increased production in 1946 should reduce import needs. The demand for rice may increase, however, because the potato crop failed in upland areas this year, and rice often is substituted for potatoes.

The area to be planted to rice in October 1946 may be larger than the rice area of last year. The Bolivian Development Corporation is clearing more land, is purchasing machinery for cleaning and polishing rice, and has a program for purchasing land that can be utilized for the planting of this cereal.

French Guiana

The Government of French Guiana during the war promoted rice cultivation, but difficulty was encountered in engaging workers to grow the crop. Most of this country's small requirements are imported. Production amounts to about 20,000 bushels (290 tons milled) annually, or almost one-fourth of French Guiana's normal consumption. Per capita rice consumption in this country is larger than that of several other South American countries; but, because of the small population, the country's total requirements amount to only about 1,500 tons annually.

North America

In North America, the area planted to rice in 1946-47 was maintained at its high wartime level in most countries. The acreage in the United States exceeded the wartime record of the preceding year, but production is forecast at slightly less. The rice area of Mexico is expected to be somewhat larger than in the preceding year. Cuba's 1946 crop is about the same as last year's harvest. The United States produces more than three-fourths of the North American rice, and the remaining output is distributed about equally among the areas of Mexico, Central America, and the Caribbean Islands.

The 1945-46 rice production in all parts of North America showed a gain over the output of the preceding year. The total harvest of 90 million bushels (1.3 million tons) was 25 million bushels (365,000 tons milled) larger than the prewar average, and over 50 million bushels (730,000 tons) larger than production 20 years ago. Moderate increases in 1945-46 occurred in the United States, Mexico, and most of the Caribbean countries. Production also that season was larger in some of the Central American Republics but was reduced in others. All countries of North America capable of growing rice have been successful in increasing production during the past 20 years, the greatest rise taking place since the war began. Although unfavorable weather in the Central American countries and the Caribbean Islands during the past 3 years kept the harvests below the record of 1942-43, a marked upward trend in rice acreage has continued in all these countries. The total rice

consumption of North America in 1946 is not up to the prewar level because of decreased imports into the Caribbean area since the war started.

United States

The crop estimate for the United States 1946 harvest as of October 1 was 69,912,000 bushels (1,022,000 tons milled) compared with the record of 70,160,000 bushels (1,026,000 tons) in 1945 and the prewar average (1937-41) of 53,149,000 bushels (777,000 tons). The 1946 acreage was estimated at 1,533,000 acres, an increase of 2 percent over last year's, but the yield per acre was lower than the 46.6 bushels obtained last year. As of October 15, harvesting was progressing favorably in southern United States, and in California a record crop was being harvested under excellent conditions.

The 1945 rice production of the United States was the largest in its history, about 2 million bushels (29,000 tons milled) more than the record of the preceding year, and 20 million bushels (290,000 tons) larger than the prewar average. This large return was, however, reduced from early expectations by storm losses, particularly during the late harvest. The record acreage showed a gain of 450,000 acres over the prewar (1937-41) average, and this gain is equal to almost one-third of the total area harvested in 1945. The average yield of the past 5 years was about 5 bushels less than the 50 bushels per acre obtained during the late 1930's.

Table 26. - RICE: Production, trade, and apparent utilization in the United States, averages 1932-33 to 1941-42, annual 1942-43 to 1945-46 a/

Year beginning August 1	Production		Imports b/	Exports	Shipments to territories c/	Apparent utilization
	Rough	Milled				
	1,000 bushels	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
Average:						
1932-33 to 1936-37	41,518	607	d/ 45	53	151	448
1937-38 to 1941-42	53,149	777	19	179	162	455
Annual:						
1942-43	64,549	944	5	237	130	582
1943-44	64,843	948	1	242	166	541
1944-45	68,161	997	3	246	149	606
1945-46 e/.	70,160	1,026	f/ 2	359	139	530

a. Includes milled rice and rough rice in terms of milled converted at 65 percent. b. Calendar year following year of harvest.
c. Puerto Rico, Hawaii, Virgin Islands, and Alaska.
d. Includes an average of 32,000 tons for the brewing industry.
e. Preliminary. f. January-July.

Compiled from official statistics.

Table 27. - RICE: Exports from the United States to specified countries, averages 1932-33 to 1941-42, annual 1942-43 to 1945-46 a/

Country of destination	Average 1932-33 to 1936-37	Average 1937-38 to 1941-42	1942-43	1943-44	1944-45 b/	1945-46 b/
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
United Kingdom	5	3	56	30	9	(c)
Netherlands	3	2	0	0	11	(c)
France	7	2	0	0	3	1
Belgium	4	3	0	0	0	(c)
Germany	6	(c)	0	0	0	0
Soviet Union	0	(c)	22	26	17	2
Others	6	11	(c)	2	8	3
Total Europe	31	21	78	58	48	6
Cuba	11	137	123	149	166	168
Canada	4	10	25	19	18	15
British West Indies	(d)	(c)	1	6	2	5
Netherlands Indies	(d)	(d)	0	0	0	30
Philippine Islands	(c)	(c)	0	0	0	93
China	(d)	(d)	0	0	0	32
Others	7	11	10	10	11	10
Total	53	179	237	242	245	359

a. Includes milled rice and rough rice in terms of milled converted at 65 percent; August-July marketing year.
b. Preliminary.
c. Less than 500 tons.
d. If any, included in "others."

Official records, Bureau of the Census.

The apparent domestic utilization of rice in the United States showed a gain through 1944-45. In 1945-46 total consumption declined but remained larger than the prewar average. This decline was brought about by the Government's appropriating rice for shipment abroad, since the strong domestic demand could otherwise have materially increased consumption. The average per capita consumption as food in 1945-46 was 4.4 pounds compared with the prewar average of almost 6 pounds. (See table 26.)

United States rice exports rose sharply during the war (table 27). The all-time record of 1945-46 was twice as large as the average exports during the 5 years ended with 1941-42, the last year of production before the war started. Through the cooperation of rice farmers and industry during the war, increased supplies were made available for export in an effort to meet the enormous demand that arose in importing countries

after exports from the main rice areas of the world ceased. United States rice exports went to the Allied countries during the war and have since gone to areas of the Far East having critical rice shortages. The United States has also continued to send Cuba the major part of its rice requirements and supplied 78 percent of that country's total imports in 1945-46.

Because of the necessity of supplying Allied countries with rice during the war, United States shipments to possessions (table 28) generally were less than in prewar years. Those to Puerto Rico, except during the shipping scarcity of 1942-43, increased slightly up to 1945-46, but records show that quantities sent to Hawaii were less than the prewar shipments. Some rice may have been released by the Army for Hawaiian consumption, however, which was not reported in trade statistics.

Table 28. - Rice shipments from the United States to possessions, averages 1932-33 to 1941-42, annual 1942-43 to 1945-46 a/

Possession	Average 1932-33 to 1936-37	Average 1937-38 to 1941-42	1942-43	1943-44	1944-45 b/	1945-46 b/
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
Puerto Rico	110	119	108	139	122	105
Hawaii	40	42	22	27	27	33
Others c/	1	1	-	-	-	1
Total	151	162	130	166	149	139

a. Includes milled rice and rough rice in terms of milled converted at 65 percent; August-July year.
b. Preliminary.
c. Alaska and Virgin Islands to January 1941; thereafter, Alaska not separately classified and shipments to Virgin Islands included with Puerto Rico to 1944-45.

Official records, Bureau of the Census to 1940-41; thereafter also records of the Production and Marketing Administration.

Mexico

In Mexico, preliminary reports indicate that the production of 1946 will be slightly larger than the 1945 crop (table 19). Current high prices were expected to encourage increased plantings, and weather conditions during the first part of the season were more favorable this year than last. It is too early, however, to predict the final outcome of the harvest, most of which will be gathered by December.

In 1945, for the third successive year, a record output was harvested in Mexico, although acreage was slightly smaller than in the preceding year. Favorable weather during the latter part of the season brightened early prospects for a poor crop, and the outturn was unofficially reported to be the largest in several years.

Supplies are not considered sufficient to meet fully the increased Mexican demand for rice during 1946, despite the fact that the harvest of December 1945 showed a gain of about 2.1 million bushels (30,000 tons milled) over the prewar average and exports have been prohibited. Rice exportation was forbidden by decree in 1943, record exports the preceding year having exceeded 25,000 tons.

Nearly 40 percent of Mexico's rice is produced in the Yaqui Valley, State of Sonora. The extention of irrigation and the employment of modern growing and harvesting methods similar to those in the United States have facilitated a substantial increase in the acreage of this area during recent years. About one-fourth of the Mexican crop is grown in Morelos, where production, dating from colonial days, supplies the market in Mexico City. The average yield for this State is more than 70 bushels per acre, compared with the average of 40 bushels per acre for all Mexico.

Canada

During 1945, Canada obtained all its rice imports from the United States, taking 27,000 tons of rough and 3,000 tons of milled rice. Most of the imports usually enter in the form of rough rice, which is milled in Canadian mills. The United States has been the principal source of supply during the war, although some quantities were taken from Mexico before rice exports were prohibited by that country in 1943. Before the war, about 75 percent of the Canadian imports, which averaged 28,000 tons of rough and 8,000 tons of milled rice, came from the Far East, principally from Burma.

Caribbean Area

The Caribbean Islands require the heaviest rice imports of any area in the Western Hemisphere. Consumption in this region before the war is estimated at 485,000 short tons, and about 420,000 tons of these requirements were imported, including shipments received in Puerto Rico from the United States. The largest consumption, averaging over 100 pounds per capita, was in Cuba, and in Barbados, Trinidad, and Tobago in the British West Indies.

Except for imports into the British and French West Indies, which were materially reduced when the war curtailed supplies, a large volume of imports into the Caribbean area has continued to be necessary during

the past 20 years. Cuba's imports exceeded 200,000 tons annually before the war, and the British and French West Indies together imported almost 75,000 tons. The demand for rice in this region has become greater since that time as the result of an increase in population, even though former imports were not obtained.

The rice imported by the British and French West Indies before the war originated principally in Asia and in British Guiana, with the British West Indies alone taking almost 20,000 tons annually from the latter country. Of total imports into the British West Indies, Jamaica took over 20,000 tons a year, Trinidad and Tobago together around 20,000, and Barbados about 10,000 tons. Imports into the French West Indies totaled about 13,000 tons. Since 1942, all these islands have imported reduced quantities of rice because of the world scarcity; hence their consumption is still considerably below the prewar level. Virtually the only source of supply has been British Guiana, although a small quantity is imported from the United States.

A record 1945-46 harvest was obtained in the Caribbean area as a whole, but it represents less than 10 percent of the population's requirements. The acreage was again extended in places suitable for growing rice, and yields generally were above average. Although the outturn, as compared with requirements, is relatively small, production on the islands has shown an upward trend. Special efforts have been made to increase production, particularly since supplies were cut off as a result of the war.

Dominican Republic. - The 1946-47 acreage planted to rice in the Dominican Republic was expected to be up to the wartime level. Early in the season, rains benefited the crop in both the paddy and highland areas of production, which indicates that a large crop may be harvested.

The 1945-46 rice production in the Republic was reported to be the largest ever obtained. Both the upland rice, harvested from July to September, and the irrigated crop, harvested from December to March, returned exceptionally good yields. Slightly more than 5,000 tons were exported in 1945, principally from the preceding crop, compared with the record of 10,300 tons in 1942. Most of the exports during 1945 went to Cuba.

The Dominican Republic has not always been a net exporter of rice. Before 1930, almost 30,000 tons were imported, but with the inception of a rice expansion program to increase the domestic crop, imports gradually decreased. In 1940 rice exports began.

Haiti. - In Haiti, the Government announced that a surplus of rice amounting to 890 tons was available for export from October 1945 through September 1946, which might indicate that production in 1945-46 was about average compared with that of recent years. The record crop in

1942-43 amounted to 860,000 tons milled, from which 1,600 tons were exported. Rice formerly was one of Haiti's major import commodities, but by 1942 the crop furnished domestic consumption together with some rice for export.

Cuba. - Cuba is the principal rice-importing country of the Western Hemisphere. Imports of 192,000 tons during 1945 were the smallest since 1942, when the imports were reduced to the lowest point in 9 years by the wartime scarcity of shipping. Of total imports, the proportion of rice obtained from the United States during 1945 represented 81 percent, whereas that from Ecuador and Chile equaled 15 and 3 percent, respectively.

As a result of reduced imports into Cuba and heavy demand, Cuba's rice stocks at the end of September 1946 were the lowest on record, and rice was selling from 20 to 30 cents a pound. Buying usually is active at the time of the United States harvest, but because of uncertainty in regard to Cuban Government price policy and United States OPA ceiling prices, little rice was purchased up to September 30, either from the United States or from Cuban producers.

The supply from the Cuban harvest in September-October of 1946 totals about 50 million pounds of milled rice, or about the same as last year. Because of high prices, growers originally planned to increase the rice acreage, but heavy rains reduced plantings to about 90 percent of the expected area. Domestic output usually equals about 10 percent of Cuban rice consumption.

Asia provided the largest share of Cuba's rice requirements before the war. The United States has been the principal source of Cuban rice imports since 1940 only, although the first substantial increase in imports from the United States occurred in 1937. Two factors contributed to the subsequent marked gain: (1) The reduction of the Cuban import duty on United States rice from $1.68 to 84 cents per 100 pounds in 1934 and (2) promotional activities in 1937 by United States interests. In the early 1930's, British India, including Burma, supplied from one-half to two-thirds of the total. From 1935 until the war, Siam was by far the principal source. Imports from French Indochina rose gradually to a peak of 40,000 tons in 1939, when about half the Cuban rice requirements came from Asia and half from the United States. (See table 29.)

The Cubans began to make special efforts to increase rice production in 1941. Weather conditions generally since that time, except in 1943, have proved unfavorable for rice growing. Although the factors of uneven rainfall, limited irrigation, and scarcity of soils that are well adapted to rice growing may tend to check a rapid acreage expansion in the future, production may continue at a somewhat higher level than in former years.

Table 29. - Rice imports into Cuba, by country of origin, averages 1932-41, annual 1942-45

Country of origin	Average 1932-36	Average 1937-41	1942	1943	1944	1945 a/
	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons	1,000 short tons
Orient	167	101	(b)	0	0	0
United States	10	116	136	158	181	155
Ecuador	0	(b)	12	44	42	29
Chile	0	0	4	15	4	6
Mexico	0	(b)	12	2	0	(b)
Others	13	1	7	2	1	2
Total	190	218	171	221	228	192

a. Preliminary.
b. Less than 500 tons.

Compiled from official figures.

Trinidad. - The problem of securing rice in Trinidad continues to bring swamplands into cultivation. The 1945-46 acreage was two and one-half times as large as the prewar average, and plantings are being extended in 1946-47, with the Government for the first time assisting in the development of large-scale production. This does not mean, however, that Trinidad can produce enough rice for its own needs, since sufficient land is not available to grow all the island's requirements. Although the acreage in 1945-46 was greatly increased, production was only about equal to that of the preceding year because of rain damage.

Central America

The total 1945-46 harvest of Central America is estimated at 6.4 million bushels (95,000 tons milled) compared with 5.8 million bushels (85,000 tons) the preceding year, and 4.6 million bushels (65,000 tons) before the war. Increased production in Nicaragua, Costa Rica, and Honduras was responsible for the gain over 1944-45, for poor crops were harvested in the other countries. Rice production in Central America as a whole has trebled during the past two decades. Only in 1943, however, following the record harvest of the 1942-43 season, were supplies sufficient to provide total requirements. The total rice production of these Republics, although now exceeding their former utilization, does not cover requirements, which have also increased the past 20 years. Imports are still necessary, therefore, in normal years.

Nicaragua. - Extremely dry weather during the growing season reduced Nicaragua's first 1946-47 rice crop by 50 percent. The acreage of the second planting, made in September, was expected to be large; therefore the total outturn will depend on the size of the December-January harvest.

Increased plantings and favorable weather in 1945-46 resulted in a record production following a small crop the preceding year. Ordinarily, such a crop as that of 1945-46 would have covered domestic requirements and furnished some rice for export. Because of the reduced harvest of August 1946, however, the Government ceased to grant permits for rice exports.

Honduras. - A record 1945 crop in Honduras of 1,150,000 bushels was nearly three times the size of the prewar (1935-39) average. Although about 1,000 tons were imported annually during the prewar period, the 1945 production was considered more than sufficient for domestic requirements. Despite the apparent surplus, exports during 1946 were expected to be negligible, since domestic prices were higher than those paid by importing countries. Some rice was sent to Cuba, however, during the first part of 1946. Most of the Honduran crop is produced along the northwest coast, where there are potential rice-growing areas not yet developed. Although production has shown a definite upward trend, growers, as well as millers, have been handicapped by lack of transportation.

El Salvador. - The 1945 production of El Salvador was 15 percent less than the very poor crop of the preceding year and the smallest in 6 years, according to preliminary figures. The drop in production resulted primarily from a reduction in the area planted, since the yield per acre was only slightly below the prewar average (1935-39). The small acreage sown by farmers last season might be attributed to the unusually small yields of the preceding year. They appeared to be the result not only of dry weather but also of planting on submarginal land. This country's rice production is not so large as that of Nicaragua or Panama; yet, because of a smaller consumption, before the war, it was the only country in Central America that exported rice consistently. Exports from the small 1945-46 crop, however, may be negligible.

Republic of Panama. - Dry weather caused a serious drop in Panama's 1945-46 rice production, although acreage was increased and prospects early in the season were favorable for a record crop. Because of the small harvest and the difficulty in obtaining supplies from other countries, Panama has suffered from a rice shortage this year. About 5,000 tons are usually imported, but because of the small crop, this quantity apparently would not be sufficient to meet the deficit. Short supplies in Ecuador, which has been the chief source of imports in recent years,

severely limited importation during the first part of 1946. Although Panama's crop is the largest in Central America, its imports are also the largest. Rice is the basic food of the people, and consumption, according to estimates, averages about 150 pounds per capita.

The marked expansion in rice growing that occurred during recent years resulted primarily from a vigorous Government program designed to stimulate production. The agricultural department provides technical information and distributes seed, fertilizers, and agricultural implements, which are either loaned or sold at cost. Since the climate and land are well-adapted to rice growing, production of this cereal could be increased in the future.

Costa Rica. - The record 1945-46 production of Costa Rica was 52 percent larger than the small crop harvested the year before. The acreage was greatly increased by means of loans offered by Government and business agencies to aid rice production. During the war, the gradual increase in the rice acreage resulted in a large measure from Government encouragement. Although until 1945 production failed to rise in proportion to the acreage planted, both rice consumption and imports rose perceptibly. Record imports amounted to 5,000 tons in 1944, when supplies in Ecuador were larger than in the two succeeding years, but difficulty was encountered in 1945 in securing imports. The increased production of 1945-46 was considered sufficient to provide domestic requirements until the harvest of the first crop in October.

Guatemala. - The 1945-46 Guatemalan crop was 20 percent less than that of the preceding year, despite a slight increase in acreage. The reduction was caused by lack of rainfall and labor shortages; in some instances, 30 percent of the crop was lost through delay in harvesting. Although minor shortages occurred during the first half of 1946 because of this small crop, no serious scarcity was expected before the August harvest in early producing localities. Production usually is about sufficient for domestic use, a large proportion of the rice being raised on small holdings, milled at home, and consumed by the growers themselves. The approximate balance of about-equal imports and exports is due to geographical conditions and transport difficulties.

British Honduras. - Production is of minor importance in British Honduras, compared with total consumption. About 1,250 tons are imported annually to meet requirements. During recent years nearly all the rice imported came from the United States. Both the rice acreage and outturn expanded somewhat during the war as a result of Government encouragement. Measures included experimentation for improved methods and varieties and the granting of loans to growers to assist in cultivation of the crop.